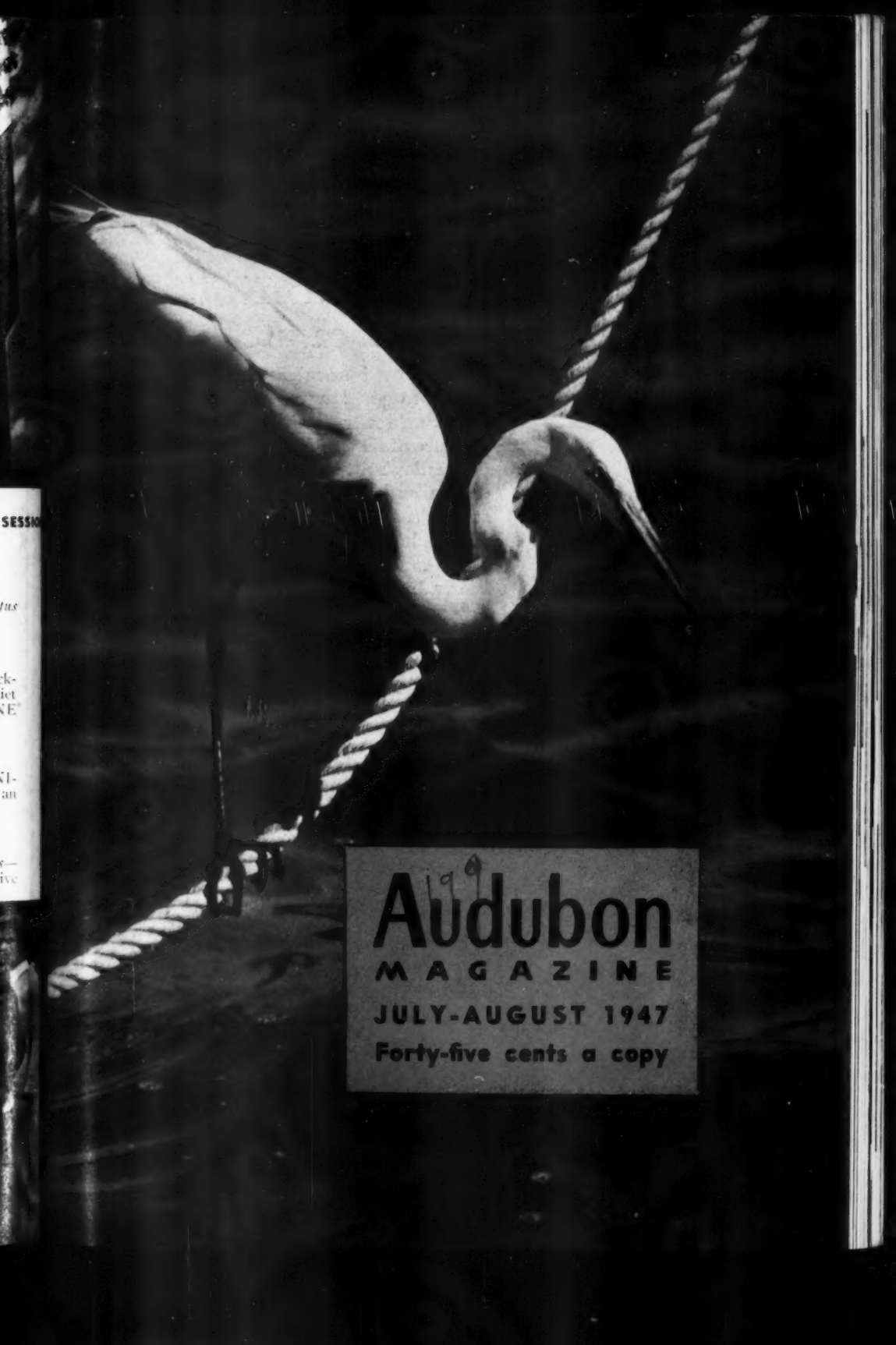
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AUDUBON MAGAZINE is published bimonthly by the National Audubon Society. Subscription price $2.50 per year for the U.S.A., $2.75 foreign. Single copies 45 cents each.

AUDUBON MAGAZINE regrets that it cannot continue subscriptions beyond date of expiration. Checks and money orders should be made payable to AUDUBON MAGAZINE. Editorial and advertising offices, 1000 Fifth Avenue, New York 28, N. Y. Reentered as second-class matter April 29, 1942 at the Post Office at New York, N. Y., under the Act of March 3, 1879.

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Postmaster: If undeliverable, please notify Audubon Magazine on form 3578 at 1000 Fifth Avenue, N. Y. 28, N. Y.

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THE WORLD *of the* LEOPARD FROG

By Sally Carrighar

Leopard Frog by Lynwood M. Chace

In the small world of the pond a leopard frog enjoys summer, then snuggles in a rock crevice to sleep the winter months away

A MORNING came when the frog looked out from his nook and found a skim of ice upon his puddle. All summer the puddle had not dried or flooded, since the beavers kept the water of the marsh at always the same height. Reed-grass grew in the little pool. The down-bent leaves had traced their liquid circles while the frog sat in the water underneath. But on this day the stalks and the points of the blades were all held rigid. The wind, which could not sway the imprisoned leaves, now shook them stiffly.

The wind had blown all night. It whirled away the warmth of the ground so fast that dew had had no chance to form and freeze. And the dawn seemed colder with no frost to catch its small stars out of the early sunlight.

The frog was crouched below the stone that roofed his nook. His throat was soft, because his breaths had kept it pulsing. But the moisture from the glands upon his back had frozen, so that he had a new and sharply brittle skin when he awoke. He broke it, as he did a skin that he needed to molt, by hunching himself and puffing out and squirming. But he did not eat the skin of ice.

The cold was something definitely there. A creature almost felt that he was being watched. The frog had made himself compact and still, as he did when he was trying to escape a hostile eye. But the cold had found him. He should not risk one more night here in his cave.

His eyes were standing high and round, not pulled within his head as when he slept. He saw the sunshine tilting lower and lower through the grass stems, finally to the mat of runners on the ground. Above the stems the loosely hanging seed-tops were a fluff of light. A flock of small birds flung themselves down through the grass. The birds were chirping in excited haste as they

Spatterdock by Don Eckelberry

Lynwood M. Chace

foraged, the juncos and chickadees for seeds, the yellow warblers for drowsy insects. Their wings were snapping to balance them, and their feet continually grasped new holds as they slipped on the smooth straw stems. In a little gust the birds had left the grass and swept away —so limber.

There, at the base of a gentian, sunlit whiskers glistened with the motion of a sniffing nose. The red-backed mouse was out for a meal of seeds, but first he must be sure no other animal was out for a meal of him. And the frog could see the varying hare. The hare was nibbling at a clover patch. All summer he had cropped it. From habit he kept moving back in the narrowing shade of a cottonwood tree, although he showed more sharply in the shadow than in sunshine, now that his fur was white. The chickadees, the mouse, and hare could spend the winter in the meadow, for they had their own warmth. But the temperature of the frog went up and down with the heat or chill surrounding him.

Cutting and chewing were motions that the frog had never tried, but he recognized them as eating; his throat began to pulse more deeply, as it did when he discovered food. He turned to watch the grassroots now, instead of the hare.

He heard a fine dry scraping, surely an insect's chitin plates. No leopard frog would jump for a sound alone, and when he saw what caused this one, he

looked away. It was a pinch-bug. He had swallowed those and quickly had disgorged them, for they took an agonizing grip on his stomach. The frog learned slowly but remembered well.

The stir of any small thing was intriguing, even the bit of thistledown, caught on the mud, that twitched in the breeze—a mayfly? He dragged himself out into sunshine. After a while a bombing beetle popped with anger at an ant that grasped its foot. If the frog were warm he could have reached the insects by unfolding his hind toes in a long swift stretch. But his legs and also his appetite were like the ice-bound grass.

The runway of the ants and the beetle's hole were in his view and well known to him. On a fireweed stalk he saw the damselfly who often rested there, her glazed wings upright. Behind her the leaves of a willow blew in the sunlit sky. From the willow through the tops of the grass to the cottonwood tree, and from the tree to his nook and puddle were the boundaries of his summer.

What he was seeing now he knew as well as his tongue knew how his mouth was shaped: the single thistle, spiny-leaved and rigid in the swaying grass; the wild-rose bush where lady-bird beetles gathered for the aphids; under it the feathers molted by the swans and stripped of their down by mice; a weathered furry foot, left by the mink when he caught the mother of the hare. None of these things had fed or sheltered the frog, but they might be dear because they were familiar.

The sight of them was being alive. They were himself being awake. The mouse and hare and damselfly, the thistle, rosebush, feathers, and foot were himself out of his winter coma, able to hop through the grass stems, catch delicious insects, sit in the sun-warmed puddle. Another frog, at the entrance of a different cranny, would look at different things, and those, for him, would be the feel of his days. But for this frog these things, here in his eyes, were summer, the only part of the year he knew. How could he leave them now without a sense of loneliness?

He must give up the ground on which he sat. It was molded to his plump wide belly, the forefeet that he braced below him, and his hind legs, backing to a point; it fitted him. Even better because it gave him safety was the stone above his hole. The stone was glossy-smooth, for a glacier had rolled it here. Beneath it he had slept or lazily watched for insects out in the grass. He had found the stone the day last spring that he came ashore from the beaver pond and the mating assembly of the frogs.

The nook had been his home, but he must find another shelter, where he would not freeze in the winter that was coming. Any day he might drift into his long sleep. The sun had loosened his stiff legs now. He must not wait.

He lengthened in a low hop toward the pond, a hop off at a different angle, and one that bent his course again; his trail would be confusing to a follower. Each time he landed without the faintest thud or crackle of dry leaf. No bird hopped more softly. He stretched so smoothly into the next jump that he seemed to flow through the grass stems with a motion like their blowing.

Beyond the grass he reached a frog-sized bay, a cave of shadow under willow boughs. Beyond were water-lily pads, splashed by the glitter of the pond. He stopped at the shore in a little thicket of mint and bedstraw, dark but flowers of light, reflected from the ripples, tossed among the leaves. Here he was hidden from tall enemies like herons, though not from any animal on the ground. A shrew discovered him at once, but she was busy, prodding into a snail shell.

The frog would stay in the thicket briefly. Unlike active animals who chase their prey, he moved from wait to wait. He looked down to the cove and saw that whirligig beetles spun delirious circles there, a way to dodge an enemy, perhaps a frog. Water-skaters rocked in the

leaf-drift at the muddy shore, as if the wind had blown them to it while they slept with their long thin bodies slung from their overhead knees. They were still; the frog might catch one. He pulled his hind legs close to make a leap. But the skaters were awake. The breeze flung down a spider from the willow, and every skater jumped. They clambered around it, fighting for the prey.

Beneath the cove raced small, round, light-rimmed shadows cast by the dimples under the skaters' feet. The marks on the frog's skin were exactly like them. The bright lines bordering his dark spots even were metallic. The background of his smooth skin could become as brown as the mud instead of green, as now. If he were in the ooze among the dimple-shadows, no eye could detect him. He should dive.

Before he stirred himself, a garter snake slid out from the willow roots. The snake moved over the wet-shine of the shore. Her sensuous grace was hiding her readiness to flash out in a strike, but the frog knew. Gulping air till he was nearly twice his size, he now was twice as hard to swallow. He stopped the pulsing of his throat and held himself with a stillness so uncanny that he had the look of being unreal, simply not there.

The snake was followed by another. They swung around and glided toward each other with their heads up off the ground and their forked tongues flicking in and out. They came together and the tongues touched. Drawing back, the heads swung down to the ground. The snakes slid forward, close to each other, heads to tails. They coiled together intricately. But one unwound and glided to the water.

She lay in the cove, her tail beneath

Photographs by Lynwood M. Chace

the ooze, her body slanting up, and her head and neck above the surface. At long intervals her head would sway down into the water, forward and out again, with a sultry rhythm. A sharp blue-bodied dragonfly skimmed toward her. It hung a few lengths off; then darted toward her face and hovered just beyond the reach of her tongue. The snake made no sign as again and again the dragonfly shot forward on its stiff wide wings and abruptly backed away. But the dipping of the snake's head finally became faster. Once then, when she submerged, she swam away.

The frog looked back to find the snake left on the shore. It too had disappeared. Leaping in light low arcs, he crossed the beach and slipped beneath the water. He dove within the ooze, his puff of silt dispersed, and then there was no trace of him. When he left his summer life, he would be leaving dangers as well as satisfactions.

His hibernating urge was seeking just this, darkness and the feel of being covered. But instincts may conflict. He still was hungry. He pushed above the ooze but saw no prey. His eyes were somewhat like a human's, focusing in air, nearsighted in the water. He sprang to the top, to lie with his chin on the glistening pad of a water-lily and a forefoot holding to the stem.

The ripples passed as quickly as the current of a brook. He gave himself to the motion, spreading the webbed toes of his hind feet, letting the water catch them and float his legs out from his sitting-on-his-belly posture. A sheet of the water flowed up over his back, to part around his head and stream together at the point of his mouth. He pulled his eyes in half way, and the third lids rose

upon them. But the lids were clear. Through them he could see that a long-horned leaf beetle had alighted on the pad. He slowly raised his eyes, one at a time, and opened them.

The beetle had come to lay a clutch of eggs. She chewed a hole in the leaf and, standing with her back to the opening, curled the tip of her abdomen down to stick the eggs to the under side of the leaf. Beside hers, clusters of several other kinds of eggs were there. The beetle was not even a water insect, and when her young hatched, they would have to pierce the lily stem and live with their heads inside to breathe the air in the plant. But while the eggs were in the water, they would be cushioned, kept from drying out, and protected from extremes of heat and cold. The water of the pond was not alive but, even better than the land, it cradled life.

The beetle was too far away to snatch; would she fly if the frog should push up closer? No need—here, curving over the edge of the leaf, was a physa snail, a nourishing meal when his stomach juices had dissolved the shell. The frog unfolded his sticky tongue and shot it out to grasp the snail. He swallowed the mouthful, using his eyes to force it down by lowering their bulges into his throat.

Dora M. Loetzer

The snail would still his hunger. This was a pleasant way to end his summer, resting on the water and the sun-spilt leaf. But a pain shot through his side. He clutched his legs up to him. The anguish sharpened. He groped with a hind foot, tried to scrape the sting away, but could not reach it. He dropped the stem and kicked out, swimming one way and another, anywhere that he might escape the pain. He began to feel a faintness.

A clepsine leech had attached itself to his side. With her sucking piston firmly fixed in his flesh, she rode with the frog. He dashed through the water without caring where he went and darted toward a great blue heron.

The heron had seen him coming. Her snakelike neck had folded back to bring the point of her long bill close to the surface. As the frog sprang past, she stabbed for him and caught him crosswise.

Instantly his skin had sweated out a thick and glabrous fluid. It helped him to squirm ahead, although the grip of the heron's beak was strong. And his thrashing, violent and convulsive, made it hard to hold him. The heron clamped her beak still tighter. His thighs worked out of the edge, but his feet were inside. If she cut through his legs, she would lose the frog. She lightened her hold a little. He flung himself from side to side. She would do what she did with a fish, toss up her prey and try for a lengthwise catch.

But the frog was better at dodging than most fish are. He hurled himself out past her shoulder, sliced through the water, on down into the ooze. He was safe from the heron—and safe from the leech, for he had scraped her off in his struggle in the beak.

A fright is exhausting to a creature. The frog lay deep in the mud, now breathing only through his skin. Perhaps

Great blue heron by Hobart V. Roberts

here he should allow the last thin thread of consciousness to break. Yet something did not satisfy him. The ooze may have been too loose a cover. He began to crawl ahead.

The floor of the pond became more solid. Under his feet was a fine silt rather than the spongy ooze. Beyond the silt he walked on hard-packed rippled sand. A different kind of water was draining over him. With no good sense of smell he could not tell that it was fresher, but it gave his skin more oxygen, and it had a quick beat, not a smooth flow like the undertow along the ooze. He was in the current of the brook that filled the pond.

Very sleepy, he was going where his feet would take him. That course was not a blind one. His feet soon touched a shingle and were turning always toward the larger pebbles. They next found stones.

The frog had left the pond and now was moving up the brook. The water was warmer, for a passage underground had given it the temperature of the earth. The cold of winter would not reach far into the soil; so the brook would never freeze.

The frog's need for a cranny in the streambed seemed almost an ache. He crawled along in a daze but did keep going, feeling for any crevice that would hold him. Approaching a rock, his cheek slipped into an opening. A heavy hind leg dragged up, pushed, and he went in farther. The nook was not quite deep enough to enter, even in his flattened hibernating posture. But sand was under it. He squirmed down, scratching with his feet until he had a hole that held him snugly, covered by the rock. At last he could stop moving. He croaked his pleasure, with a sound like pebbles being shaken in a resonant skin drum.

His eyes were closed but he could feel the gentle flow of the brook. All winter it would smooth his skin, while he was sleeping . . . sleeping. The regularity of the current dulled the touch of it. Now the only thing he sensed was the rock above his back. A stone . . . like the stone roof . . . of . . .

Lady With Binoculars

Connie Hagar brings the ornithological world to her door in Rockport on the Gulf Coast of Texas

By Eleanor Anthony King

TO the little green-trimmed white cottage down on the Gulf Coast in Rockport, Texas, where Connie and Jack Hagar live, birds and bird-watchers stream in great waves. Few amateurs have upset as many preconceived notions about migration routes, added as many birds to a state list, or entertained as many ornithologists as Connie Hagar.

She has been watching birds from dawn to dusk, on sunny and dark days, through rain and wind, in hot and cold weather for the twelve years she has lived in Rockport. She observes the shoreline, the live-oak groves, the prairies and wet meadows, sometimes accompanied by experts, sometimes by beginners, but never alone because her constant companion is a pooch called Patch—a smooth-haired fox terrier who is allowed to bark at boys on bicycles but never at a bird!

If you expect Mrs. Hagar to be the outdoor breezy type, dressed in khaki and heavy boots, you are in for a great surprise. Connie is a tiny ninety-three pound package—dainty and delicate as a sandpiper, a fastidious dresser with a color scheme (including ear-rings) carefully chosen.

Double-crested cormorant, by A. D. Cruickshank
Connie Hagar, opposite page, by Jack Blackwell

She's the drawing-room type—with accomplishments to match. She dances (ask her for a demonstration of the folk dance "Put your little foot"), and sings, plays the piano, discourses eloquently on literature, quotes poetry, and collects shells and old glass.

Connie was born in 1886, in Corsicana, Texas, and christened "Conger" the maternal family name. From her father, Judge R. S. Neblett, she learned to observe nature and to live in tune with nature's laws. One of her earliest memo-

Scissor-tailed flycatcher — the Texas bird of paradise, her father called it. Photographed by Allan D. Cruickshank.

ries is of the day she found a mourning dove's nest and lifted out the two cream-colored eggs to show her father. He told her to replace them, and admonished: "Connie, those eggs belong to the dove. Not to you. Never disturb anything that belongs to a wild creature!"

Although Judge Neblett revered nature above all things, he did not want his two little girls and son to be one-sided. Music, literature and history were part of their early training. Connie began piano lessons at the age of six, and after finishing high school, continued her musical education (piano, violin and voice) at the Forest Park College in St. Louis. Later she attended the American Conservatory of Music in Chicago, and majored in literature in the University of Chicago at the same time.

Settling down again in Corsicana, she married Jack Hagar, a Bostonian who had become an adopted Texas son. She organized a nature club, whose programs encompassed everything from stars to flowers. Birds were part of her daily routine and for eleven years, she banded breeding birds, watching the nests carefully for the moment when the fledglings were ready to take off, at which time she placed the little numbered rings on their legs.

Her first visit to Rockport was in May 1933. She went with her sister who had been ordered to seek the healthful salt breezes of this small summer resort on Live Oak peninsula on Aransas Bay. They settled down in a tourist cottage on Highway 35. The beach, just a couple of hundred yards away, was simply an extension of their front yard. And birds! They swarmed over the sand flats and shell bars, or fed in the shallow waters. Waterbirds, shorebirds, but what species? Except for the brown pelican, there was scarcely one she had ever seen before. She purchased a copy of Reed's guide to the water birds, and began studying them.

Intent as she was on shorebirds, nevertheless she became diverted by the tremendous movement of landbirds *behind* her house. There, in a grove of stunted, wind-clipped live oak trees, hundreds of songbirds were pouring in and out. Connie was baffled. Migration until that moment had been a phenomenon completely beyond her ken. In Corsicana, she had coped with summer and winter residents; a few transients had passed through her yard, but the movement was unimpressive, and she had never heard of a migration "wave."

Before she had time to ponder it, the migration was over. Now it was June, then July, then August—in ornithological circles, a time considered "dull" in that region—but Connie Hagar didn't find it dull. There were nesting birds to watch, fledglings to band, and countless birds along the beaches. September came, and she returned to Corsicana, her identifications far from complete.

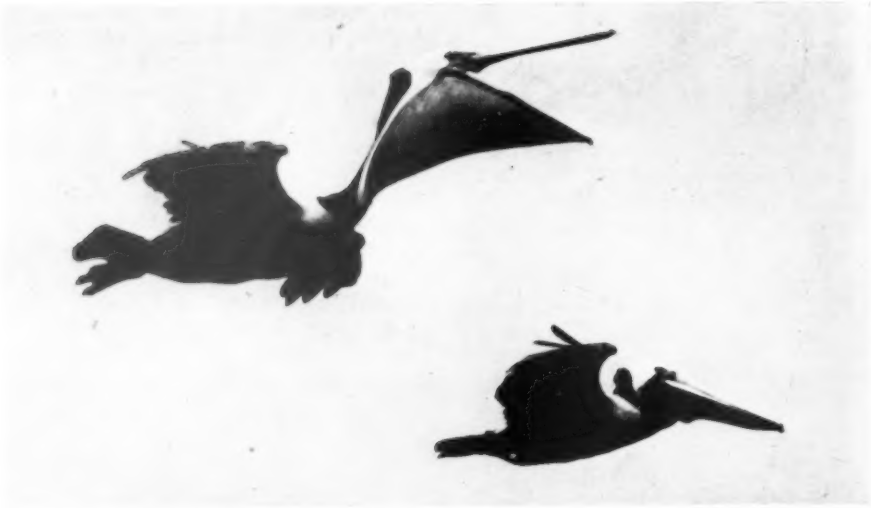
The next summer, Connie came back—this time with Jack, in whom she had gently implanted the idea that the Hagars should make Rockport a permanent

Willets, godwits and curlew
By Allan D. Cruickshank

home. Now Jack is no bird-watcher—oh, no, *not that!* But he's an indulgent fellow, especially where his wife is concerned, so he considered her proposal. However, if he moved to Rockport, what would he do, he asked? He had retired from active business, but in Corsicana he still had properties to look after.

"I don't mind moving to Rockport," he told his wife. "But don't think I'm going to sit here in a rocking chair the rest of my life. I'll have to find something to occupy my time, while you are looking at birds." So Jack bought the tourist cottages where his wife had spent the summer the year before, and in January 1935, they settled down in Rockport for good.

Winter in Rockport. That means loons, grebes, pelicans, cormorants, herons, egrets, ibises, rails, oystercatchers, plovers, turnstones, Wilson's snipe, curlews, sandpipers, willets, yellowlegs, dowitchers, godwits, sanderlings, gulls, terns, skimmers! And ducks galore—mallard, black duck, gadwall, baldpate



Brown pelicans photographed by Allan D. Cruickshank

(rafts of 5000 in sheltered lagoons), pintail (rafts of 20,000 between Rockport and Corpus Christi), green-winged and blue-winged teal, cinnamon teal, shoveller, redhead (rafts of tens of thousands on bays and lagoons), ring-necked, canvasback, lesser scaup (rafts of thousands), goldeneye, bufflehead, ruddy duck, red-breasted merganser. And coots by tens of thousands.

What a glorious dilemma for a waterbird novice! There was no Peterson "Guide" to help her and how was she to know that a laughing gull could have a white head; that a black-bellied plover didn't always have a black belly; that a red-backed sandpiper wasn't always red-backed; or that dowitchers could look too pale to be dowitchers? Finally, she discovered Bent's "Life Histories" and began to study plumages.

During March and April, the shorebirds increased in numbers. New ones arrived such as avocets, two and three hundred at a time, and white-rumped sandpipers in large flocks. Not only were birds streaming in along the shore, but on the wet prairies about six miles away. On those drowned pastures were long-billed curlews, upland and golden plover, pectoral, buff-breasted and stilt sandpipers, black-necked stilts, Wilson's phalaropes, and the dowitchers were so thick that you almost had to push your way through them with your hands.

MIGRATION had come into Connie Hagar's life in capital letters. And before the shorebird migration was finished, the Big Push had begun among the landbirds. Wave followed wave—flycatchers, gnatcatchers, buntings, grosbeaks, vireos, sparrows, tanagers, orioles, swallows and warblers. Warblers! More than forty species are known to her now—but in 1935, she could identify scarcely a dozen. Connie was in an ornithological paradise. She says that if ever she hears the angels sing, she will have to say, "I found heaven long ere this!"

In vain she combed the town for birders—for someone to help with identification. But Rockport citizens were becoming curious about the "funny little woman with binoculars" who talked about "getting" her birds.

"What do you mean, you've been *getting* birds?" they asked. "Have you got them with you? How do you catch them?

Do you shoot them?" Neighbors were sympathetic, however, and began to telephone to tell her of the "Mexican canaries" (yellow warblers) that were swarming around their homes; of the birds that looked like "Dominecker chickens" (flickers); of the "bluebirds" that were everywhere. The "bluebirds" were indigo buntings that come through Rockport in incredible numbers, making the trees and lawns blue with their presence. When the rose-breasted grosbeaks came, the neighbors telephoned frantically: "Come quick! My yard is full of little injured birds—their breasts are all stained with blood!"

Wave upon wave of songbirds flowed through from the middle of April until mid-May. It was terrific while it lasted, and Connie was a mere shred of her former self when the Big Push was over.

One day the following winter, the Superintendent of Schools gave Mrs. Hagar a letter. It was from George Williams of Houston—professor of English Literature at Rice Institute, whose hobby is birds. Mr. Williams was assembling information for the *Gulf Coast Migrant*—a publication that has since become famous. His aim was to correlate the records of independent observers along the Gulf Coast, a project that had not been attempted previously in that part of the world. The first issue was to be published in February 1936, and the letter asked for daily lists from observers in Rockport. The Superintendent gave the letter to Mrs. Hagar, and she began mailing lists. Those lists were so impressive that George Williams soon paid a visit to Rockport. For the first time, Mrs. Hagar knew the joy of birding with another real bird-watcher.

In June 1937, Mrs. Hagar received another letter that became an important landmark in her life. This one asked for bird lists, also, and was signed by Dr. Harry C. Oberholser, who had seen her reports in the *Migrant*. That Oberholser was a name famous in ornithology, that his book on Texas birds had been eagerly awaited for over a quarter-century, was unknown to our Rockport bird-watcher. To her, Dr. Oberholser was just another person interested in birds, and as such was welcome to information. Among the birds she reported were two items that were challenged: a warbling vireo (nesting) and a sooty shearwater.

Was she sure of her identification? Could she have the warbling vireo confused with Bell's vireo? If correct, she had the warbling vireo nesting 400 miles south of its known nesting range.

Patch knows all the birds—even flying apparitions like those pelicans. Photograph by Jack Blackwell

As for the sooty shearwater: where was the bird? What was it doing? How close did she get to it? For how many days did she see it? Who else saw it?

Connie sat down to answer the questions in spite of protests from Jack. "Who is this fellow, anyway?" stormed Jack. "Don't answer him. Who is he to doubt my wife?"

But Connie only wanted to get her record straight. If she was wrong, she wanted to be corrected. She wrote Dr. Oberholser that she knew the Bell's vireo well, since she had banded it in Corsicana, and did not have it confused with

the warbling. As for the shearwater, Mr. and Mrs. Terry Gill (Texas birders of long standing) had also seen it, and "enclosed is a snapshot which Mr. Gill made of the bird."

Not long after that, Dr. Oberholser came to Rockport. He wanted to meet Mrs. Hagar and her birds. Soon other doubting Thomases were on the spot. Ludlow Griscom had worked on the birds of the Brownsville region, and knew something about the records from Corpus Christi. But Mrs. Hagar produced a few choice items for him. She would show him a nice flock of buff-breasted sandpipers.

"Woman! Do you know what you are saying?" the great field ornithologist asked. "I've seen a couple of buffies in my life and am, therefore, the envy of eastern ornithologists!"

Yes, Connie knew what she was saying. She showed him a little flock of ten. Each year they come to just one small section of the prairie; they usually arrive around April 25 and stay for a week or ten days, mixing with dowitchers, pectorals and yellowlegs. They come back through in September, always to the same small area.

Today, Ludlow Griscom is no longer a skeptic. He says: "I have never been afield with anyone who knew a territory and its possibilities better. The evening before a trip, Connie predicts about what the day's list will be, and what species of interest to the visitor she can produce. Things turn out just about that way!"

It was not until Guy Emerson began making annual pilgrimages to Rockport that Mrs. Hagar thought of compiling a life list. An enthusiastic proponent of the "lure of the list," Mr. Emerson holds the *amateur* record for piling up the largest list of species in one year. He gave Mrs. Hagar an A.O.U. Check-List and suggested that she mark in it the date and place of observation of every species and sub-species she saw. She has done this faithfully during the last few years, but she doesn't bother to keep a running total. The last time she counted, she had a total of 450. Her Rockport list numbers 374, and among these are six which she has added to the Texas state list: Lucy warbler, sooty shearwater, great white heron, Würdemann's heron, American scoter and harlequin duck.

When Mrs. Hagar first reported the Connecticut warbler, some of the ex-

Mrs. Hagar's guide book showed laughing gulls in this plumage, but there was no picture to help identify the white-headed phase. (Photograph by A. D. Cruickshank.)

perts said: "Impossible. You're too far west. Those birds use the Atlantic flyway, and come into and leave the United States through Florida."

But Connie says: "The poor little things didn't know they were supposed to go another way, so they just kept coming through Rockport, and I kept reporting them."

When she reported the bay-breasted warbler in considerable numbers, on certain days outnumbering all other warblers five to one, she had no idea that the species had previously been marked as rare on the Texas coast. . . . When she reported that blue-gray gnatcatchers poured through in great waves, "wave following wave so that you have the impression that no other bird is common," she did not know she had made a discovery. Previously, the bird had been reported as drifting through when observed in migration in other regions. . . . When she reported a fall migration wave of 3000 ruby-throated hummingbirds, she added an observation that means the westward extension of the bird's route. The old maps show the route leaving the U. S. through the Mississippi Valley proper, cutting across the Gulf to Yucatan. . . . When she reported 25 blackpolls in her yard in one wave, she didn't know that their migration route was much farther east. . . . When she reported a wave of Franklin's gulls, numbering into tens of thousands, the experts said they knew the birds migrated through Rockport, but were unprepared for such numbers. The citizens of Rockport said the gulls looked like confetti in the sky.

With such records as that, you can understand why George Williams considers her one of the bright stars among his *Gulf Coast Migrant* reporters. On occasion, he takes space to publish a Hagar report such as this one made in the April-May issue in 1942:

> "What a fine time I have had this spring. Things have been erratic and spotty, but new birds have been seen as well as the finest hawk, anhinga and Franklin's gull migration I have ever seen.
>
> "I saw my first woodcock (May 17-20) feeding with three Hudsonian godwits that came on May 14 and stayed five days. Along with them, I saw the Mexican grebe, but only for one day—May 14. Why it got up here from the Valley, I don't know.
>
> "Then the bobolink. I have not seen him here before.
>
> "If you could only have been here to see the wonderful broad-wing hawk flight. They began coming over the top of our cottages at noon, April 8. We were having dinner under the trees in the yard—that's how I knew the exact time. From the tops of the cottages to as far as the glasses could see, the sky was full.
>
> "At about one o'clock, anhingas came with them for twenty minutes, hundreds of them. Then the hawks passed until dark, clouds of drifting birds. A few Cooper's, sharp-shins and sparrow hawks were in the migration.
>
> "Next morning they passed in groups of 30 to 50 until noon. With them (April 9) were three flights of Franklin's gulls,

And how was she to know this was a black-bellied plover? Her guide book showed the bird in breeding plumage. (Cruickshank)

about 500 birds to the flight, and then no more of either. But I could not sleep for two nights, just seeing that huge volume of birds filling the whole sky. Words can't describe it!"

Mrs. Hagar is a great defender of hawks. In April 1945, local newspapers commented on the "tremendous flight of chicken hawks" that sent residents "scurrying to closets for shotguns and scarce shells." Connie's "letter to the editor" was published the next day and informed readers that the hawks were broad-wings, not chicken hawks.

"The movement takes place every spring," the letter went on to say. "About the first week in April, the hawks gather from their winter homes and start north, breaking up into smaller groups through their flight, until they reach Manitoba and New Brunswick. Their main food consists of rabbits, mice, small snakes, grasshoppers, thousand-legs, ants, spiders, earthworms and a few small fish. There is little evidence that they ever attack chickens."

It may take many a day to persuade the Texans that hawks should not be shot on sight, for that is a battle that conservationists have been waging in many states with mixed success and failure. But Mrs. Hager has made strides in making her community bird conscious. She modestly refuses to take credit for having Rockport's main street (Highway 35) and its adjoining shoreline set aside as a bird sanctuary and closed to shooting. But would this have happened if the "funny little women with binoculars" had not become one of Rockport's stalwart citizens?

Connie now carries the torch for conservation throughout southeast Texas. She is in demand as a lecturer by women's clubs, garden clubs, schools, and men's luncheon clubs such as Lions' and Rotary. She lectures on everything from bird migration to oyster culture, and also covers such subjects as music, poetry and old glass.

But lecturing is not permitted to interfere with bird-watching. If you want to go birding with Connie Hagar, however, you had better write in advance to make a date. Her time and the cottages are often spoken for well in advance. She can produce marvelous birding all-year round, and sometimes can put on an extra-special show for visitors, such as that spring when Wilson's phalaropes, black-necked stilts, red-backed sandpipers and cinnamon teal fed in a rain puddle formed overnight just a few feet from her back door! If you don't believe it, ask Guy Emerson. He was there.

Of course, everyone dreams of the opportunity to visit Rockport when the Big Push is on in spring. But don't let the idea that summer is a dull season, fool you! In August, you will have roseate spoonbills and wood ibis wading in the water-filled ditch at the far end of the Hagar backyard.

Black skimmers by Allan D. Cruickshank

Where *are the* Ducks?

By H. Albert Hochbaum

THIS is a report on 1947 waterfowl conditions in the Lake Manitoba basin. The region, roughly the size of Massachusetts, holds some of the finest breeding areas in Canada. Large marshes lie on the poorly drained land near the lake, while scattered sloughs and potholes pattern the agricultural prairie and the parkland. Mallard, pintail, gadwall, blue-winged teal, shoveller, redhead, canvasback, lesser scaup and ruddy duck normally breed here in abundance, while the baldpate, green-winged teal, white-winged scoter and American goldeneye are less common.

Last year severe declines were noted here in the numbers of breeding ducks. This 1946 reduction existed in the face of excellent conditions. Water, food, nesting cover were first-rate through much of the region. In other words, the dearth of nesting ducks could not be attributed to an inhospitable habitat. Nor for 1946, or any other recent year, was production curtailed by drought or by disease. Predators and fire are as carefully controlled here as any place on the range.

The outstanding characteristic of the 1946 waterfowl shortage was a great amount of underpopulated habitat, much of it of the finest kind. And there were numerous sloughs, potholes and portions of the larger marshes quite vacant of ducks.

Now that the 1947 nesting season has reached its climax (this is written June 3), it is clear that the number of ducks returning to breed here this spring is far lower than in 1946; and the 1947 population is much below that of 1938, when ducks were beginning their climb out of the last depression. Again, breeding conditions are excellent. There are many more fine areas without ducks this year than there were last. It is a real and tragic shortage, as if most of the songbirds had failed to return to one of our big cities. It is apparent wherever one might paddle, drive or fly.

The casual observer detects the shortage on every hand. There was virtually no spring flight. The wandering eye seldom catches the darts of courting parties over the marsh, for they are few and far between. And the flights of drakes defending territories are seldom seen, for the density of pairs is so light that there is little friction. Where the roadside pond held 14 breeding pairs last year, there are only three now. The pothole by the crossing that had three pairs last year, has none. The ditch along the marsh trail, so crowded with ducks other years, has only a scattered few this May. The channel by the village store, always with its many families, has only a lone pair of gadwall. The big bay, where canvasbacks were always found in numbers of at least a dozen pairs, is empty. The country doctors who travel the same roads year after year speak of the shortage. The trappers and farmers and woodsmen speak of the scarcity of breeding ducks.

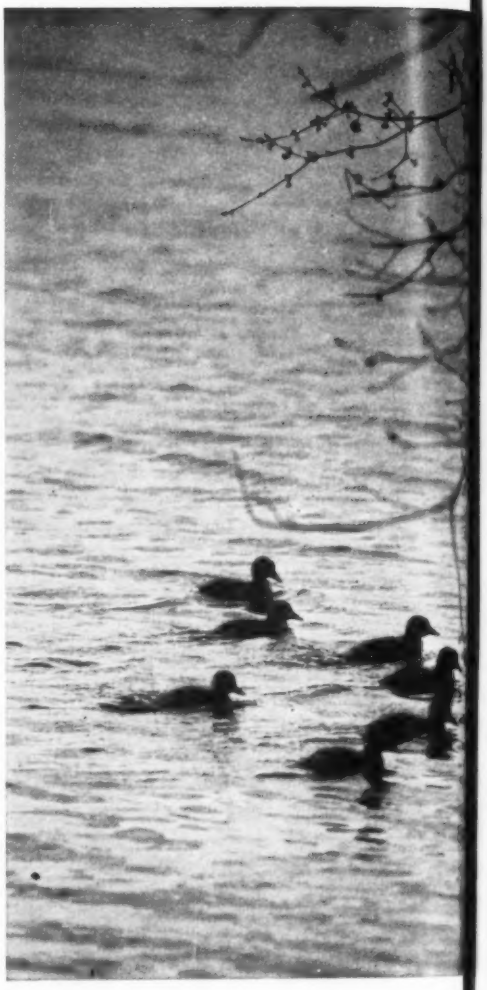
These comments, however, are not based upon casual observations. They are supported by the work of men whose job it is to study the waterfowl numbers. Robert H. Smith, Arthur S. Hawkins and David L. Spencer, Flyway Biologists for the U. S. Fish and Wildlife Service, have examined the region carefully in cooperation with J. Dewey Soper, Dominion Migratory Bird Officer for the Prairie Provinces. Lyle K. Sowls and

Peter Ward, of the Delta Waterfowl Research Station, have made intensive studies of special portions of the basin marshes. The Flyway crew, led by Smith, spent ten days in May covering the southern portion of Manitoba by air in their Grumman Widgeon, while Hawkins, in addition, has made extensive ground surveys since the middle of April. No breeding area ever before has been so carefully examined. What these fellows see from the air only verifies, for wide regions, what they are finding on the ground. Hawkins, who has examined 1500 separate water areas on land and has flown many hours with Smith and Spencer, sums up his observations with these comments: "Water conditions are good this year, but many excellent areas are either devoid of ducks or lightly populated, even as compared with the low populations of 1946."

The shortage concerns all species, but is most pronounced in the mallard, pintail and canvasback. Sowls reports the mallard and pintail to be down about 50 per cent from last year, and his records for the canvasback show only one-quarter of the 1946 numbers. The slump is so severe that even in choice areas of marsh he is having difficulty finding nests for some of his special studies.

The degree of underpopulation must be seen to be believed. Vast areas of marsh, sloughs, potholes—all bordered by fine cover and prime with food plants —have only a pair or two here and there, or in many cases, are without ducks. In mid-May I flew with Bob Smith and Art Hawkins over the large marshes of the lake basin. In the slough and pothole areas we counted 5 to 20 empty waters for every one that held ducks. And often as not, the one with birds had only a single pair.

This condition is by no means confined to the Lake Manitoba basin but, according to Hawkins and Smith, holds true for much of southern Manitoba. Sowls found a sharp decline in breeding numbers on his special study area in the Minnedosa pothole region at the edge of the Riding Mountains. I accompanied Hawkins on a trip through northeastern North Dakota the third week in May and of 169 suitable breeding areas examined, 89 had no ducks.



Mallard family group

One stands in awe before these duckless waters. It seems impossible that the terns, the blackbirds, the wrens, grebes and coots have all come home to breed,

but not the ducks. On May 21, Hawkins and I found a beautiful 40-acre bulrush marsh in southern Manitoba whose total duck population consisted of one mallard drake!

All of this is something to think about. This country is the long-grass prairie. This is the land that is the steady breeding ground year after year. True there are variations from wet to dry, so that some years are more favorable than others. But as a whole, this is not the land of drought. The vagaries of weather and season never are as severe here as in the short-grass country farther west.

Moreover, it is a sizable portion of the total breeding grounds of the game ducks. And for the canvasback and redhead it is a large parcel of their prime range. Whatever conditions may be elsewhere, however many ducks may be found on other parts of the breeding grounds (for local shortages invariably are explained in terms of more birds someplace else) this regional scarcity of resident ducks in a large portion of the long-grass prairie is serious.

Proposals are being advanced that this is going to be a good year for ducks, that with good production the slump will be stemmed and wildfowl once more will start upward. Bear in mind, however, that the decline is now at least three years deep—and all of those years have been generally favorable for duck production in this area of 1947 shortages. It seems doubtful that one more good year can restore their numbers.

Already, too, come reports from this region of increases in breeding numbers. There may be some localities, indeed, where there are more ducks than last year, but we have not reached them in our surveys. However, two such reports were investigated carefully, and in these places the same scarcity of residents was found. The records of good numbers were based upon observations of late passage migrants. Good news is contagious and it may well be that the general public will hear more of the favorable and less of the bad.

Photographed by Allan D. Cruickshank

There is little more to say at this time. An important portion of the duck breeding grounds is seriously underpopulated this spring of 1947. What bearing this may have on the overall waterfowl situation, we cannot say. But clearly in the Lake Manitoba basin, and in much of the adjacent terrain, the ducks are slipping fast away.

COUNTING THE BIRDS

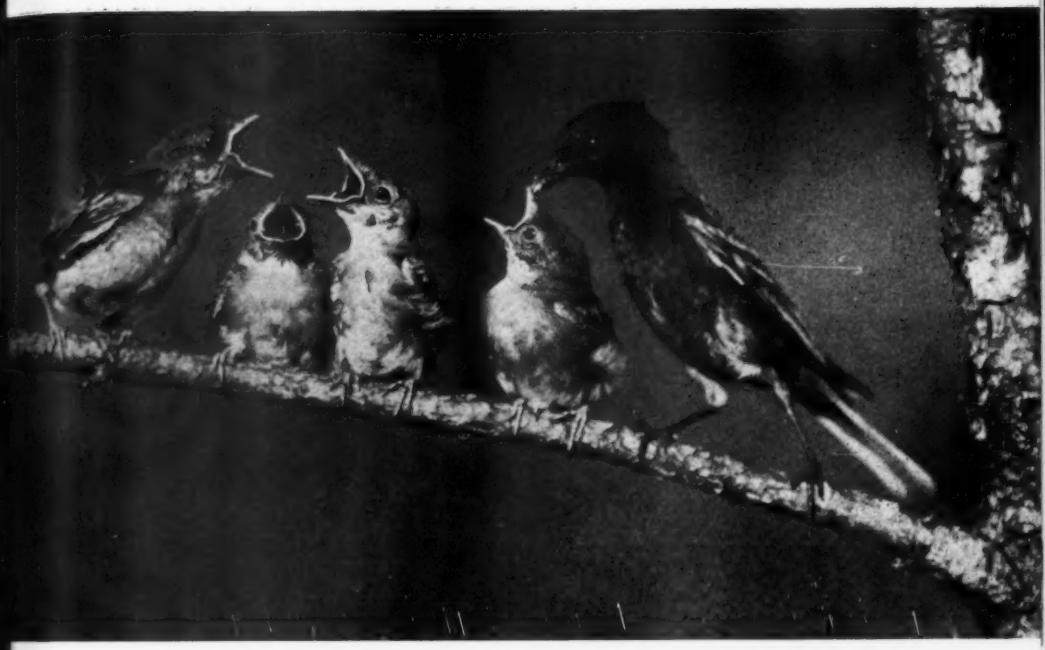
If we want to keep our wild creatures, we must know how many we have—and where

By John W. Aldrich

HOW frequently we long for the "good old days" when early settlers found the unbroken forests "teeming" with bird life!

But were the unbroken forests actually "teeming" with birds? It all depends on your basis of comparison. On the basis of what we know today of the relative abundance of birds in unbroken forests, as compared with the variety of habitats

Blazed trees mark census lines. Photograph by Ralph E. Lawrence



Five pine warblers out on a limb, photographed by Samuel A. Grimes

which develop when forests are cut down, it is reasonable to believe that most species of birds are more abundant now than during the days of our forefathers.

Although the value of making exact population counts was not appreciated in the days of Wilson and Audubon, and, therefore, exact knowledge of abundance of birds in those days is lost to us, we still have a chance to learn the effects of changing habitats on bird population. We even have the opportunity to study the differences between the few remaining wilderness areas and those affected in so many ways by man. In fact we must get comparative figures on the bird populations of the many different habitats available to us just as rapidly as possible, so that we can appraise the effects of the various forestry, agricultural and engineering practices on the abundance of birds.

How does the modern biologist secure the necessary figures for comparison? For a specific instance, let's follow the steps of a study made last year in southern Georgia of the effect of DDT on bird populations.

The early morning of April 1, 1946 found two ornithologists of the U. S. Fish and Wildlife Service quietly moving back and forth along parallel lines through two similar forest areas in southern Georgia. From time to time they stopped to listen intently and then make notations on maps which they carried. They were marking the exact position of birds which they heard.

From the top of a tall slash pine to the right came the thin trill of a pine warbler. From a dense clump of wax myrtle to the left issued the drawled note of a white-eyed towhee, a hundred feet farther on sounded the rollicking "tea-kettle, tea-kettle" of a Carolina wren, another hundred yards and another pine warbler was noted on the map. Back and

forth across the two 50-acre plots of pine woods cruised the two observers alert to every sound or movement in the tree-tops or undergrowth that betrayed the presence of bird life. Notations were made frequently on the maps because this was the height of the breeding season in southern Georgia and birds were in full song.

That night the two ornithologists marked on species maps the positions of each bird seen or heard during the day's field work. A different map was used for each species. Each day, during the ensuing week, the process was repeated and the pattern of distribution for each species in each area began to unfold.

For instance, by the end of the week the dots on the pine warbler map showed that the numerous breeding pairs of this species were relatively closely spaced, while the red-bellied woodpecker map contained only two groups of relatively widely spaced marks. The confinement of individual breeding pairs of birds to definite breeding territories at this time of year makes this method possible. The abundant pine warblers were seen to have rather restricted territories, while the much less common red-bellied woodpeckers were clearly shown to range over fairly large territories. By counting the aggregations of spots it was possible to determine the number of breeding territories of all birds in each of the 50 acres of pine forest.

Gully into pond—and back came the birds

At sunrise on the seventh day after the bird census was begun, a U. S. Public Health Service plane roared down over one of the pine woods areas. Faint clouds of vapor appeared at the wing tips and at the end of the tail. Back and forth across the woodland at tree-top level the pilot cruised, following a previously plotted course, and a fine mist of DDT solution settled over everything. The speed of the plane and the amount of spray released from the jets were exactly calculated to spread a definite amount of DDT on each acre of woodland. Evenly spaced pieces of filter paper recorded the distribution of the fine droplets of solution which fell to the ground, and later, in the laboratory, revealed the actual amount of DDT which fell per acre.

The Public Health Service was interested in finding out what effect this treatment would have in controlling the ticks which are a serious menace in many wooded areas in southern Georgia; the Fish and Wildlife Service was interested in the effect on the nesting birds.

Immediately after the plane headed back for its base in Savannah, the two ornithologists began their bird census again: in the sprayed area, and in the unsprayed area, a half mile away. This second week's census revealed a total population of 54 pairs per 100 acres in the unsprayed area, and 61 pairs in the

sprayed area. These figures represented increases over the populations of the previous week of 4 pairs in the unsprayed area against 10 pairs in the sprayed area. The increase occurring as it did simultaneously in both areas may be construed as a normal seasonal change in the breeding population. Therefore it seems evident that the DDT had had no immediate injurious effect on the bird life.

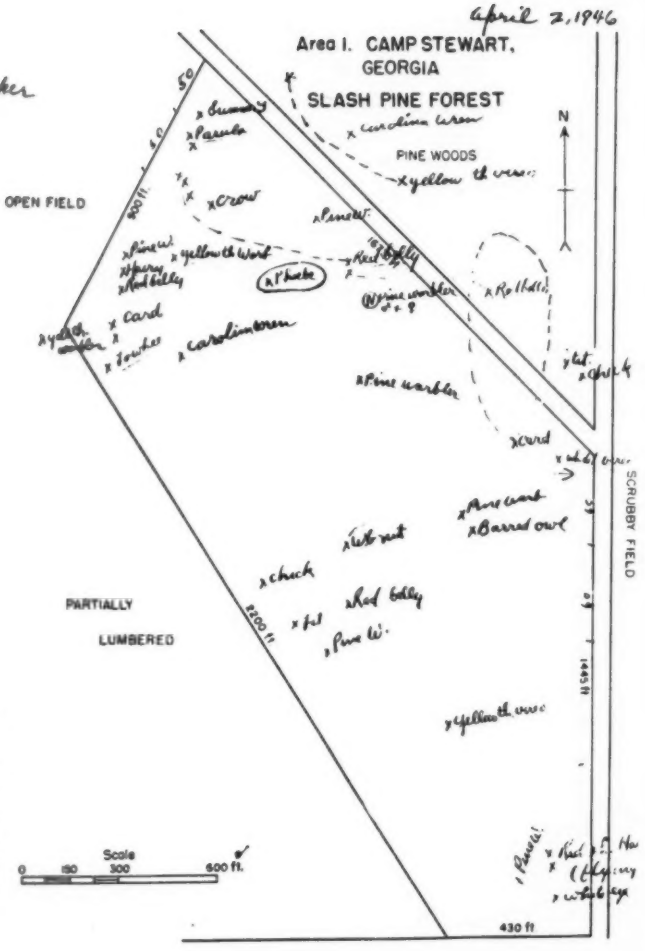
This is only one of several studies made in the United States and Canada by Fish and Wildlife Service biologists during the past two years to measure the effect of large-scale insect control on wild animal life.

A bare ten years ago bird population research in this country received its first real impetus with the promotion of amateur censusing by *Bird-Lore,* precursor of *Audubon Magazine.* However, the seeds had been sown about 15 years earlier by Wells W. Cooke, of the U. S. Biological Survey, who encouraged amateur observers to make breeding-bird censuses. During those years the methods were expanded and improved by Aretas A. Saunders, working in western New York, and by Victor E. Shelford and his students at the University of Illinois. In the early part of the last decade I was fortunate in being one of a group of graduate students in Cleveland, Ohio, who became enthusiastic about the possibilities of bird population work. S. Charles Kendeigh, then instructor at Western Reserve University, was the tutor of this group, and Arthur B. Williams, one of the students, did much to arouse popular interest in making population studies. So successful were his efforts that nearly half of all the studies published in *Bird-Lore's* first "Breeding-Bird Census" were contributed by members of the Cleveland group. The spot-mapping method worked out at that time has become known as the "Williams Method" and is the basis for the technique most commonly employed today in population work.

Red-bellied woodpecker by Samuel A. Grimes

The importance of understanding the relation of numbers of birds to their environment should be obvious. Yet like so many obvious things the importance of this phase of wildlife research, even yet, has not been fully appreciated. "Ding" Darling, former Chief of the Biological Survey (now the Fish and Wildlife Service) was a great advocate of the idea that we must know what wildlife we have, and how much, before we can get very far with management. It is significant that his administration as Chief coincided with the rise in interest in population work in the early 1930s.

The importance of uniformity of habitat in the sample measured is of prime importance. The habitat—the sum total of the environmental factors under which the birds live, including other animals and plants which make up the natural community—is the real measur-

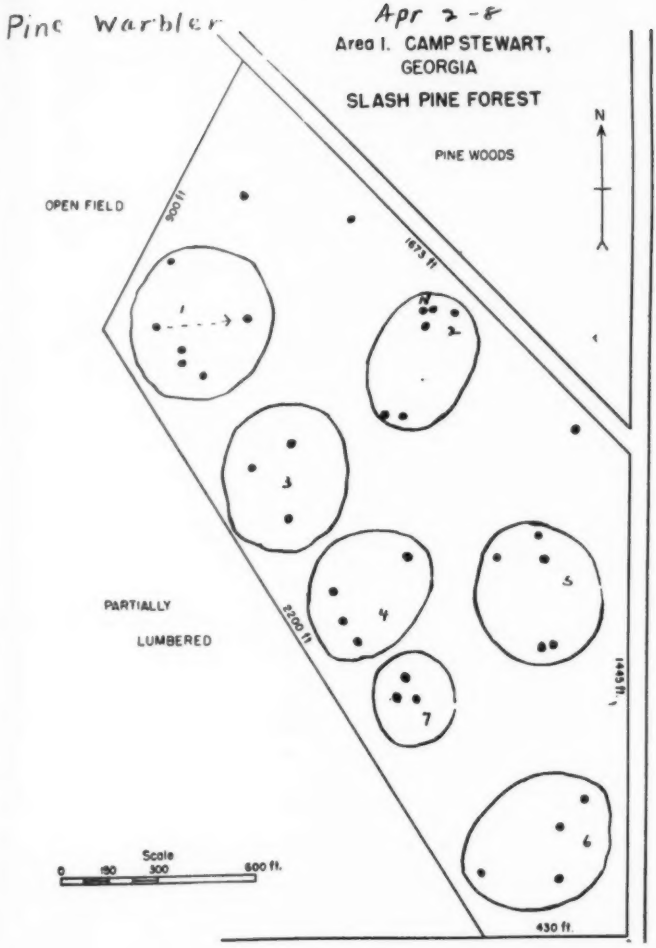


Field map (left); species map (right). Clusters of spots on species map, indicating day after day occurrence of a bird of the same species near the same place, are taken to signify the presence of a breeding pair.

ing stick in appraising populations. If population figures are to be comparable, areas of uniform habitat must be selected for comparison. To attempt to measure populations on areas of mixed habitats would be just as illogical as if a grocer were to place several kinds of vegetables on the scales at the same time in reckoning a customer's bill. Different habitats have distinctly different population values and must be measured separately. In appraising a breeding population of birds the unit used is usually the number of pairs per one hundred acres of a certain habitat.

One of the purposes in knowing the abundance of a bird in a given habitat is to understand its distribution better. Regions where the species is common—where conditions are presumably best suited to the species—may be considered its normal range. Regions where it is scarce—even in what appears superficially to be favorable habitat—may be considered as outside of, or on the border of its normal range, and approaching conditions unsuitable to the success of the species. Knowledge of regions, or life zones, as well as habitats which are suitable to certain birds, is of vital importance to wildlife management.

We need more and more up-to-the-



In the next issue we shall publish detailed instructions on how to take a breeding bird census. Written by Richard H. Pough, the article will tell you how to choose your census area, how to lay out the grid, how to make species maps, and how to take notes in the field.

minute population information in all sorts of habitats so that we can keep track of the trends in species increase or decrease; so that we can detect the danger signals when the populations get too low for safety, and learn something of the nature of natural cycles of abundance. S. Charles Kendeigh has some evidence that our warbler populations fluctuate with the rise and fall of spruce budworm epidemics in the north country. There are unlimited possibilities of learning important facts about the relation of birds to outbreaks of insect pests and they all hinge on having reliable figures on abundance.

Progress has already been made in measuring the effect on bird populations of cattle grazing in woodlots. Charles A. Dambach, in his work in Ohio, reported a marked superiority in ungrazed woods as a habitat for birds chiefly because of the practical elimination of the shrub and herbaceous elements of the wildlife community by the cattle. Since woodland grazing is a poor soil-conservation practice also, it, therefore, has two counts against it as a desirable agricultural practice.

We need information on the effects of fire on bird populations. It is becoming increasingly evident that certain types

of burning result in increased numbers of certain birds. Controlled burning is also becoming a recognized forestry practice under certain conditions. Effective tick control has been demonstrated by the use of fire also. Experiments are already under way at the Patuxent Wildlife Research Refuge, of the Fish and Wildlife Service, at Laurel, Maryland, to determine the effect of burning, as well as other forestry practices on wildlife populations.

For many years there has been a great furor over the damage to bird life resulting from the mosquito control practice of ditching and filling marshes. The effects of the reduction in amount of marsh habitat has become alarming. At best this type of habitat, which is essential to the support of a number of species, including some of the most desirable game birds, is rather limited. Some studies have been made which show the poverty of bird life on the barren fills of these former marshes. It would have been helpful to have had more exact data on the abundance of birds in the marshes before they were changed to demonstrate more graphically the loss in wildlife values which must be balanced against the control of mosquitoes.

Vast projects in the United States for power development and flood control are now in the process of being planned. Some of these far-reaching programs will drastically alter extensive areas of excellent habitat for fish and wildlife. What will be the results of creating impoundments where meandering or swift-flowing rivers now move their loads of water to the sea? Biologists cannot always give final answers, but changes which will result from proposed impoundments can be predicted on the basis of before and after censuses on similar projects already under way.

It seems to be natural for us to be very much concerned with the conservation of vanishing species. Unfortunately the concern is usually greatest when the population has been reduced to such a low ebb that it cannot be brought back even by the most intensified efforts. It is essential to have some quick and effective method of appraising the measures being taken to preserve endangered species. This has been brought to our attention particularly forcefully by the rapidly varying fortunes of our waterfowl. Methods of accurately and rapidly censusing breeding waterfowl populations have still to be perfected, but progress is being made in solving this problem through concerted effort by Fish and Wildlife Service biologists.

In the past, too much confidence has been placed on information gained from inexperienced or prejudiced witnesses. In a county in Oklahoma in 1937 there was much excitement over the destruction of crops by crows which resulted in some extremely exaggerated claims as to the abundance of the black miscreants in the region. From questionnaires sent to farmers it was ascertained that there were 13 crow roosts in the county containing 1,053,000 crows. Direct field inspection by biologists of the Fish and Wildlife Service determined that actually there were two crow roosts containing a total of only 168,000 crows!

It cannot be too strongly stated that we must have reliable data on bird populations under all sorts of conditions —natural as well as man-made, before we can hope to manage wildlife with a maximum of satisfaction. One of the chief obstacles to a more rapid expansion of this vital work by the various agencies responsible for the administration of our wildlife resources, is lack of properly trained personnel to conduct investigations of this sort. However, more and more attention is being given by universities to teaching students the fundamental biological concepts and techniques necessary for this type of work, and it seems likely that expansion of the program of bird census work will continue to accelerate until it has reached a magnitude in proportion to its importance in wildlife research.

Photographs by Gary M. Daetz

It's Always FAIR WEATHER

By Alan Devoe

IT IS recorded in the book of Genesis that the Creator looked upon the creation and found it good. In our moments of tranquillity and soundness, we all feel this sense of the excellence of things. Here and there the feeling comes to possess a man with a sureness of conviction that is firm against all changes of mood and whim; and there is produced a saint, shouting "Gloria!" even as he feels death upon him, or there is produced a meditative holy-man murmuring "All is well" even as a sou'wester blows away the roof from over his head.

Naturalists are not commonly saints; and it would be too much to suppose that a spiritual climate of uninterrupted beatitude prevailed at Slabsides or at Walden Pond or around Dan Beard's every campfire. But it is a fact that among the world's naturemen there does largely prevail a mood or a mental habit that is at least, in its imperfect way, something like the mood and habit-of-mind of Saint Francis. There does prevail a kind of large contentment and serenity, and a certain refusal to be plunged into despair or rage by life's particular and personal catastrophes. When it was a sunny day, Thoreau thought that was fine. But he also seemed to think it was fine when it rained, or snowed, or hailed, or sleeted. John Muir delighted to peer up at one of his noble sequoias, and to find it good that the great tree towered so straight and strong against the sky. But he also seemed to find a kind of ecstatic satisfaction, and a sense of fulfillment and the rightness of things, when the vast trunk and spreading branches were smashed to earth in a storm.

What is there about being nature-minded that produces, at its best, this

quality of being also tranquil-minded? The answer lies, of course, in those keywords of the Genesis statement which speak of "looking upon *the creation.*" The Creator is said to have looked upon the totality of things. He looked, with an all-encompassing vision, upon the creation as a Whole. It was this Whole that was to be judged for its soundness and healthfulness and flourishing; and the Maker looked upon it and so judged it, and found it good.

It is the essence of nature-mindedness to look upon the creation (insofar as is possible to a creaturely being like ourselves) in exactly this same sort of way: with a long view, a wide view, a far view, trying to see the Wholeness of the thing. And the larger and longer a man's view, the more he comes to relegate the Whole's ingredients and particulars to their proper subordinate place, and to see them as only parts and portions within the greater pattern of the thrivingness of the Whole.

The death of a fox, looked at personally and isolatedly, may look like a tragedy. But if today there are foxes capering and exuberating gladly in the outdoors, it is because yesterday other foxes died. Today's trees are thrusting upward and glorying in the sun because their roots are sunk in the bone-dust of the trees of yesterday, which had their season and passed. The tide rises off South Africa; a throng of violets bloom in a New England meadow; a snowshoe rabbit is caught by an Adirondack owl; and all these events are caught together in the infinitely interwoven web of the Whole. Here is the living Whole, shimmering and shining and thriving, as it throve back in the dawn of creation "when the morning stars sang together." Into its maintenance, to conserve it at each moment in the everlasting felicity of its repose-in-progress, go unreckonable myriads of interrelated factors. Some of them, seen in isolation, may seem hard for us to pronounce "good." It may seem hard to see any excuse for a weasel. It is easy to think that this or that creature of the creation is a "pest," and that we should be better off without it. We may fancy that if we were the Creator, we'd have arranged things, in our presumably superior wisdom, differently. But the more nature-minded a man becomes—the more long-viewed, the more disposed to see nature as a Whole, and its parts in the light of that understanding—the more he comes to accept, and finally to rejoice in, each and every of the particulars that go together to produce this general goodness of the walnut-sound and apple-sweet and life-exulting Whole.

Weathers, for instance. If a man thinks in small terms, and only of happenings' direct effect upon his immediate interests, he will spend a dismal lot of his life in fretting and complaining about bad weather. But naturemen don't think in those terms; and they don't feel that way. Rain? Snow? A rip-roaring wind? A natureman looks at all these; and then he looks far out beyond them, where their effects go spreading out into the texture of the Whole; and he is made to feel, without any Pollyanna silliness or sentimentalism about it, that rain and snow and wind are really all fair weather.

The song about April showers, which insists that "it isn't raining rain, you know, it's raining violets," may speak in syllables of dreary banality; but it speaks truly. May violets grow out of April rains as surely as worm-eating warblers grow out of worms and the cleanliness of a prairie antelope's skeleton grows out of the grisly activity of vultures. The snow may get in the way of a man's train and prevent his getting to Chicago on time for Christmas dinner; but, considered in a wider sense, it is this same snow that quilts and saves the vegetation, and leaches slowly into the earth and waters it, and that thus is strictly responsible for the green glory of the man's next summer's vacation. It would be stretching things only a little—in one of those dramatic exaggerations that

Thoreau loved—to say that it is only because there is snow that there *is* any Chicago to be delayed in reaching. For the role of snow in preserving northern vegetations is very nearly vital; and without vegetations there would not only be no Chicago, there would be none of us at all.

It is easy to grow fretful about "too much rain." But the surface of the land is only a little portion of what requires to be watered. To be nature-minded is to extend the mind's vision to the deep water-tables under the ground, and to be aware of how vitally the natural economy is dependent on their maintenance. In many places in our country, the water table has fallen to twice as far below the surface as it originally was. In one midwestern state, it has fallen from eight feet to fifty-nine feet under ground. Today, the most prolonged rainy spells of "bad weather" are hardly enough to sustain the level of the waters under the earth, on which we depend for all our wells and springs and the health of deep roots. To see the whole picture, nature-mindedly, is to realize not only the importance of "bad weather" but the interlinked importance of certain "bad" features of the natural landscape: swamps, marshes, bogs, natural ponds and little shallow lakes.

Swamps function, in the economy of the Whole, to collect rains and melted snows and to feed the water very, very slowly into the earth, so that it gradually makes its way to the subterranean water-table. Forests, where the dead trees and the fallen leaves decay to make a spongy matted floor, function to the same end. It was in failing to see this Wholeness of things, and in draining sloughs and clearing away forests, that we created those disastrous conditions of quick run-off, erosion, and falling water-tables that so much conservation effort is now needed to remedy. If we keep our vision narrow, a day of pouring rain in a swampy landscape may look to us a sullen and dreary thing. But the farther we see into the creation's wholeness, the closer we come to rejoicing in rain as delightedly as in sunshine and to rejoicing in swamps as delightedly as in any golden upland.

The furious thunderstorms of midsummer, now, perhaps tempt us more than any other weathers to a short-sighted irritation with the nature of things. Surely, this tempestuous uproar that snaps branches and smashes trees, that even beats and buffets small birds to death with its fury . . . surely even the most infatuatedly sentimental naturalist can scarcely rejoice in *that?* But in fact the sentimentality does not lie with the naturalists. There is no sentimentality in the vision of the Whole. On the contrary, there is a rigorousness. What culls the weak trees in a forest? What agency lops away deadwood, and plucks out the weakest or stupidest individuals from a species of bird or animal, and—as it were—flogs the lazing or dulling biota into new alertness and fresh health? What but such tempests? It is naturalists, looking large-mindedly upon the creation, who pronounce it good. It is sentimentalists who refuse acknowledgment that what is good may also be terrible and stern; or that the death of the particular may have its place in the healthiness of the Whole.

Thunderstorms? Not many of us, perhaps, can attain completely that wide-insighted understanding which would enable us, like visionary old John Muir, to exult as serenely in these wild tumults as we exult in morning bird-song or blossoming wildflowers. But the farther and deeper we look into nature's wholeness the closer we can come to it. The closer we can come to knowing that, in a true sense, it really always *is* fair weather. The closer we can come to that inmost kind of peace, and that unimprovable old wisdom, which are the fruit of looking on the creation, whole, and seeing that it is good.

Life Cycle *of a* Thunder Storm

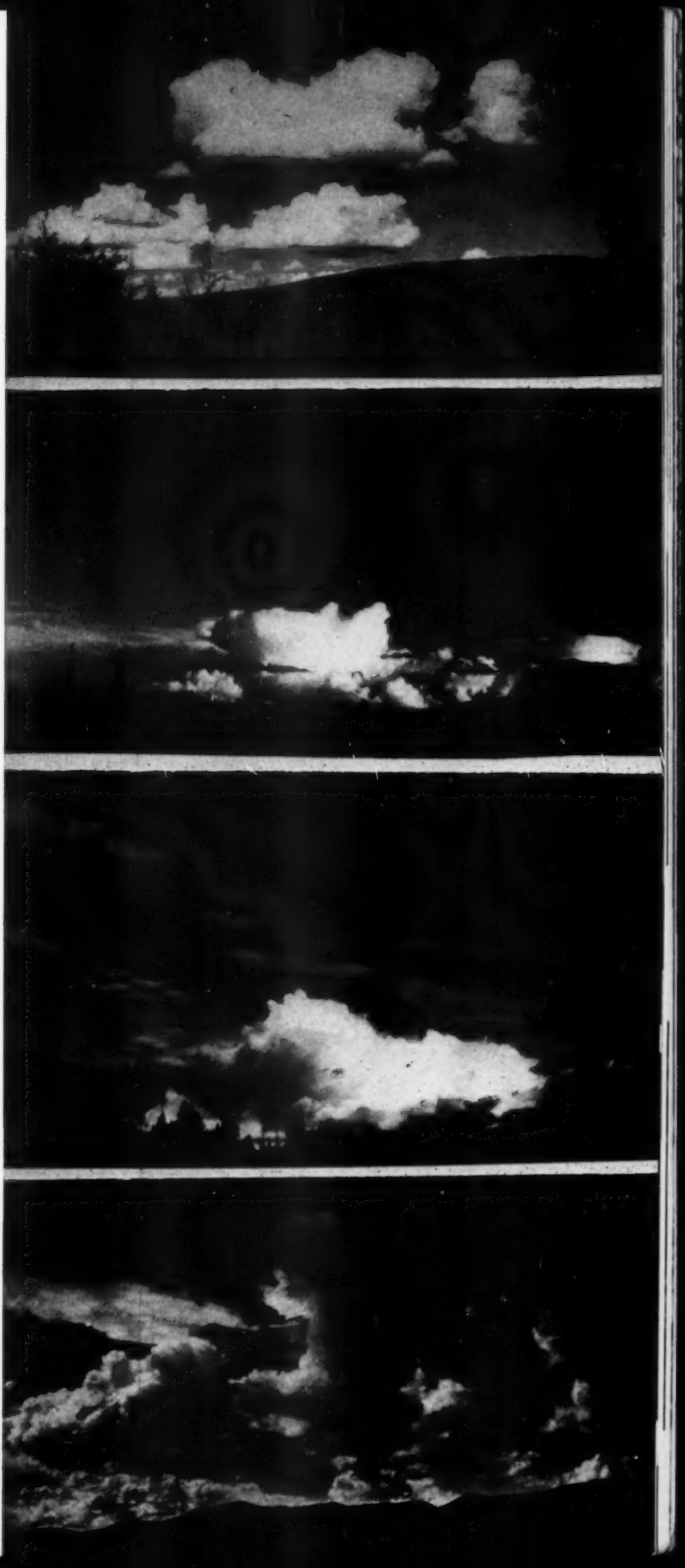
a picture-story
by Gary M. Daetz

A moist air mass is moving slowly from the southward over the prairie. The bright sun rising rapidly in the sky feels hot and oppressive to the farmer as he walks to the barn to begin the day's work, and he comments to himself that the day will be a hot one, as he glances at the sultry sky.

Little puffs of cumulus clouds begin to fleck the sky as chimneys of warm air start streaming up from the heated surface of the prairie. They thicken and expand at the top, their bases remaining flat, marking the level at which condensation of the rising moist air occurs.

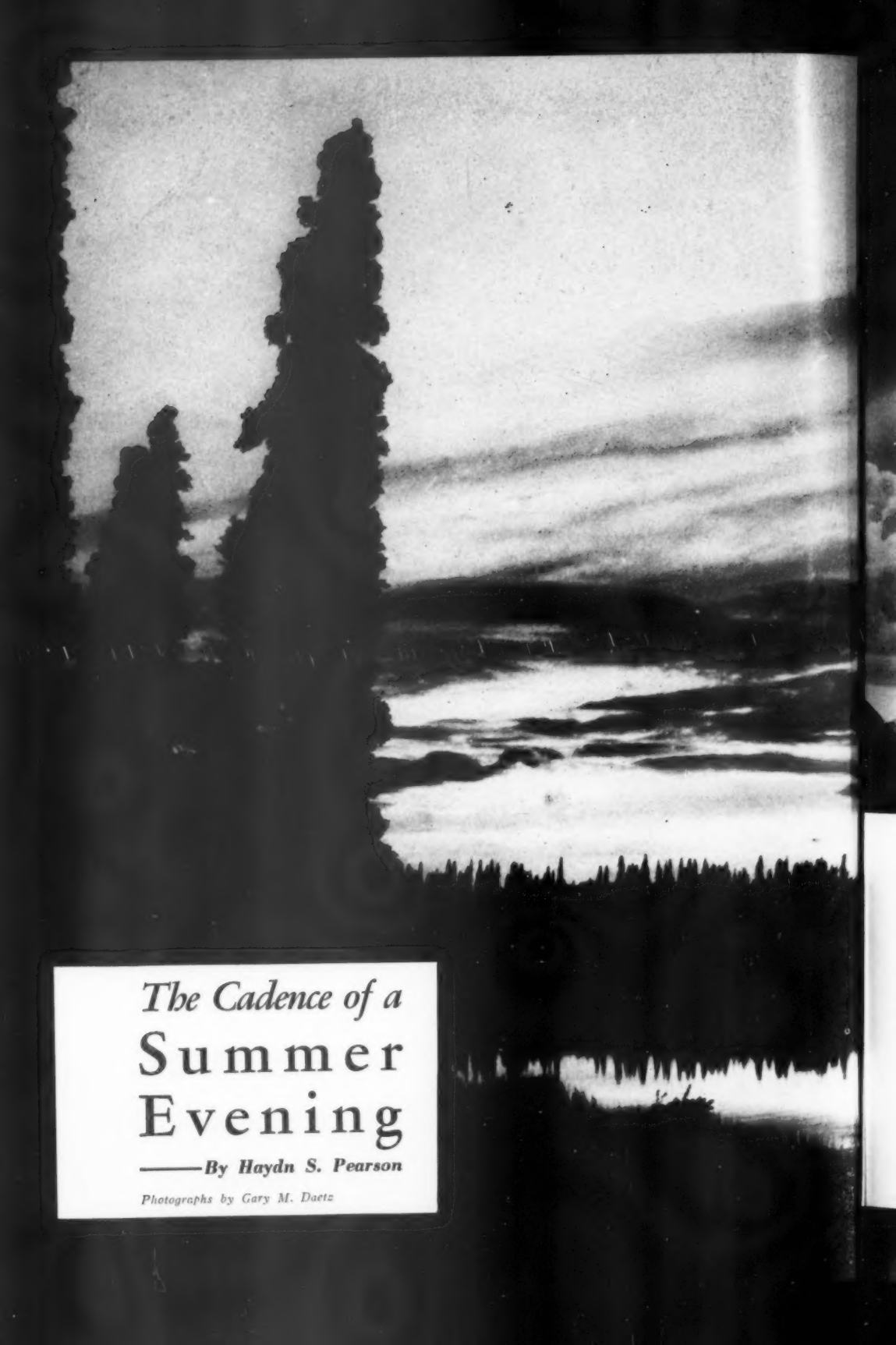
By the time the sun has reached the highest point in its travels across the sky, the puffy cumuli of the early morning have grown into heavy, swelling cumulo congesti, whose dark shadows run up and down the foothills beneath them as the clouds approach the mountains.

The air mass lifting over the mountain passes gives added acceleration to the vertical development of the clouds, which unite and begin to assume the characteristic shape of a thunderhead, cumulonimbus.



The trees stand breathless in the valley, listening to the rumble of the approaching storm. Soon the storm itself hangs over them, flashes of lightning illuminating the vast interior. A cool gust of wind rushes across the valley and a few large raindrops spatter in the dust. The storm is upon them, lashing the trees with life-giving rain, filling the dry creek beds with its vigor, uprooting the weaker trees and giving strength to the stronger.

And the storm rolls on, its satellite clouds giving additional showers to the land over which it has passed. Then, having had its day and having accomplished its purpose on earth, the mighty cloud top flattens out and sprawls across the sunset in long lines of stratocumulus vesperalus — a most fitting conclusion to the life of a giant.



The Cadence of a Summer Evening

——By Haydn S. Pearson

Photographs by Gary M. Daetz

LOOKING back thirty years to the days on Mountain View Farm there in the valley north of Monadnock it is difficult to know which memories are most vivid in mind. But among those I recall best are the evening hours we sat on the porch and listened to the music. After supper was eaten around the big table with its red and white checkered cloth, the kitchen readied up, the milking done, calves fed, and the cows put in the night pasture, we gathered on the porch to watch night drop the curtain on day's activities. Shadows inched down the boulder-studded pasture behind the house and crept out across the mowing field the other side of the road.

Before the sun cut across the line between earth and sky, the music began. The frogs started their monotone bass symphony from the swamp; the crickets fiddled their altoish notes. Ruby-throated hummingbirds came to the delphiniums and hollyhocks in front of the porch. "Little jousters," Father called them, "miniature knights with pointed spears." One advantage of having a father who was both a minister and a farmer was that he welded literature and nature study.

As the sun decreased the distance between itself and the mountain rim, the introduction to the evening's music was the accompaniment of the chimney

swifts' aerial circus. The swifts delight in the interlude between day and night. With rapid beats of long wings they wheel and dive, circle and climb. As they cut capers in the air there's a running commentary of staccato twittering. *Chaetura pelagica* is an exuberant, extrovertish fellow. Father explained to us in answer to a logical question that the swifts are an example of adaptation. Before the pioneers built chimneys the swifts lived in hollow trees and holes in cliffs. Now they prefer a man-built environment. Each year a swift or two came down the chimney into the living room or a bedroom. When Sister asked Father why he didn't put a screen over the chimney tops in summer to keep the swifts out, Father's answer was, "I like to see them around." Many a night after I went to bed in my small room under the eaves, I could hear the twitterings and talking of the swifts in the chimney.

Before the last of the swifts had dropped on fluttering wings into the chimneys, we heard the sleepy calls of robins from the old orchard; the good-night song of the veery in the bushes by the brook at the foot of the lawn; the last sweet whistles of the white-throated sparrow calling, "I am here too; I am here too." But the music I remember best just at day's end was the lovely liquid overtones of the wood thrush. In a ravine at one side of the pasture, a hundred yards or so from the house, there must have been two or three pairs of wood thrushes. Father always claimed that the music was like the solemn beautiful harmony of a pipe organ. It was simple melody but indescribably sweet as it floated through the dusk.

Then as the dusk grew deeper about the farmyard, though the tip of Mount Monadnock might still be a point of purple and rose, the whippoorwill started his evening song from the stone wall by the garden. No song of any bird has just the same effect on me. I delight in the poignant plaintiveness of the wood pewee's long, drawn-out notes; there's a certain haunting lonesomeness in the night heron's nasal quawk. The loon's eerie laugh fits the environment of northern lakes; a crow's raucous caw on a bleak, brown November day is in keeping with a year sliding down hill toward low twelve.

But the whippoorwill's sad, strange song on a quiet, warm, summer's evening is different. There's weird witchery about a bird that sits for long periods and rhythmically sends its sadistic message through the darkness. Yet the passive plaintiveness fits perfectly with the darkness. Fireflies are lighting their lanterns over the lawn. Night's stillness has fallen. Still *Antrostomus vociferous* sits on the wall and throws his notes persistently to the night.

The other bird that always came around on a summer's night was the nighthawk. One cannot say much for him as a musician. His bass "boom" is made by the air rushing through the strong primary feathers as he checks his descent after a vertical dive. But as we sat there on the screened, dark porch listening to the evening music it was not a false note when the nighthawk's sudden "boom" punctuated the darkness.

There were, of course, other sounds on those evenings of long ago. A mile up the valley the church bell tolled the passing of the hours. Occasionally a dog's bark came across the valley from a farmhouse on the Ridge Road to Randborogh. Perhaps a screech owl sounded off from the rocky upper hillside near the pasture top. Once in a while we would hear the peculiar grunting bark of a red fox.

It was all a part of a pattern. Nature's life lines are many and varied but behind all the seeming mystery is a Great Spirit that ordains the inexorable cycling of the seasons, the balancing of species, the bud, the open flower, the leaf, and the fruit. The music in the evening that I heard as a boy on a New Hampshire farm was a part of Nature's great symphony.

Blackberries in blossom Photographed by Rutherford Platt

The Field Trip *and the* Leader

By Maurice Brooks

IN the days that saw Darwin and Agassiz, Thoreau and Burroughs afield, men bore with pride the title of "naturalist." After a while, serious students of nature began to search out the detail of microscopic structure, of pathogens and their control, and the patterns of heredity. Biology moved into the laboratory, and the field "naturalist" fell into disrepute. Only through the magic of the microscope—so it was felt—could the secrets of nature be unfolded.

Today, serious biologists have again decided that the study of living things in their chosen surroundings may contribute to fundamental knowledge. Teachers counsel their students to look afield, and lead them there. Furthermore, the scientist has recognized that he owes a debt to the interested layman — an obligation which he can meet by a well-planned and well-conducted trip into the outdoors. The present-day ecologist, thinking of living things as members of a community and bringing a social concept to biology, is merely the old-time naturalist equipped with new tools and broader knowledge. He and his followers are making "field trips" a respectable part of formal and informal teaching and learning.

Bird students, amateur and professional, have done much to bring the field trip into better repute. They are a numerous brotherhood, and their interest is likely to burgeon in most unexpected places. They have learned to pursue their hobby—or their vocation —in the field, in part because few of them have access to great museum collections of birds, and also because living birds with all their movement, color, and song are more appealing than stuffed mounts or desiccated skins.

The progression from bird enthusiast or bird student to naturalist is a direct one. The beginner soon comes to associate certain birds with certain types of vegetation — grasslands, wooded borders, dense woods, or water margins. He begins to notice the effect of temperature, wind or other weather as increasing or decreasing the likelihood of good "birding." He notes the influence of physiographic features — lakes, mountains, rivers. He cannot fail to see something of the habits of the birds he is watching — their feeding on certain fruits or nuts, their choice of nesting sites, their seasonal presence or absence.

Presently, these observations begin to

It's worth halting to watch a warbler . . . this magnolia warbler was photographed by A. D. Cruickshank

organize themselves. Birds and the plants with which they habitually associate become communities. The outdoors, for all its complexity, assumes a pattern, and takes on reason for being. The bird lover is thinking along the lines of an ecologist. His outdoor experiences have deeper meaning and bring sounder satisfaction. He is able, properly guided, to impart some of this meaning and satisfaction to others.

People who enjoy the outdoors are likely, sooner or later, to be invited to serve as guides for others in quest of learning. Almost certainly they will be asked to lead field trips, so popular with schools, organized camps, or interest-groups.

Field trips are of many kinds. They may involve only a few enthusiasts who have no desire for leadership or formal instruction. The discussion which follows has to do, however, with the more formal type, where the leader is also the teacher. Some suggestions are ventured in the profound conviction that a field trip, properly led, can add riches immeasurable to the lives of those who participate.

1. *The leader of a field trip need not be an encyclopedia of the outdoors.* Many teachers and youth leaders believe thoroughly in field instruction, yet are loath to attempt such leadership because of genuine or fancied lack of knowledge. I would not belittle knowledge, but it is physically impossible for any leader to know *everything* in the field. The time must come when the honest leader answers, "I do not know."

The touchstone to this situation lies in directing the attention of the group *to the things you do know.* This may involve a relatively simple situation, in which there are comparatively few species to be dealt with. I often take a beginning group to a fence-row along a road or at the border of a vacant lot. Here the major plants are likely to be few, and of familiar species. A grown-up fence-row in my territory is pretty sure to have sumach, blackberry, wild cherry, greenbrier, sassafras, elder, and poison ivy as common plants. Does everyone in the group know all these species? Probably not. Is it significant that all these plants produce fruit edible for animals? How did they happen to get started here in the first place?

While we are present, there may not be a bird in the tangle. That last question, however, inevitably leads us to consider birds and their place in the community. Every major plant species in the fence-row could have been, and probably was, planted by birds.

Do the birds derive any benefit besides food from the tangle? Are rabbits or other animals finding shelter here? Thus we get to the matter of cover and

its importance to wildlife. Having brought up the twin requirements of food and cover, we are well on the way toward a practical lesson in wildlife management and conservation.

The possibilities are endless. What kinds of birds feed on these fruits? If the season is right, we see some of them. What of the poison ivy? Can the birds eat the berries without harm to themselves? Will it benefit the landowner to keep his fence-rows clean, or may something be said for allowing thickets to grow?

This is an outdoor situation within easy reach of most schools in the nation, and it provides a full biological experience, without demanding highly specialized knowledge on the part of the teacher. The students learn something of identification, of seed dispersal, of birds' food, of cover requirements, and they may see some birds feeding. Above all, they have started to think in terms of outdoor communities, made up of interdependent plants and animals. Parenthetically, they will have been kept sufficiently occupied to have forgotten aimless questions, asked more to embarrass the teacher than in the pursuit of learning.

2. *Every field trip should have a definite, attainable objective.* This involves some planning, and is of prime importance. An unplanned bird trip may, in unfavorable weather, result in aimless wandering, a bored class, and a frustrated leader. Birds can't always be found, and certainly they cannot always be found where they may be easily observed. But there are other things outdoors besides birds, and the experienced leader will have at least one dependable string to his bow—something he can show the group without possibility of failure. It may be a vegetable or flower garden, a piece of woodland, a city park with trees to be learned, a rock ledge, or almost any other outdoor feature which is anchored and not subject to flight.

Within the plan for the trip, there must be flexibility sufficient to take full advantage of the unexpected. The trip may be planned for a study of spring flowers, but if good fortune brings a May warbler wave, with every bush alive with flashing color, why not forget the flowers? The flowers will wait; the warblers won't.

I well remember starting out to study trees with a high school class one November day. Upon reaching a river nearby there was a rush of wings, and we realized that we were afield on the one day of the season, perhaps, on which waterfowl in good numbers had been forced down. The remainder of the period was spent in excitement — and pleasure — as we watched ducks, grebes, coots, and other species unfamiliar to dwellers in a hill country. When the noon hour came, the class, with many other students, went back to the river. The students had had an experience which they would never forget, and when we returned on a later date to the study of trees, it was with anticipation that pleasant surprises might be around each bend of the trail.

3. *A field trip is not primarily a "hike."* I have no objection to walking, and I know, of course, that Boy Scouts and other youth groups take organized hikes to fixed objectives. However, the teacher who takes a class into the field cannot be too much concerned with physical education. Sound planning dictates that the class be taken as quickly and as directly as possible to the objective, with only such stops as circumstances and good fortune dictate.

People on a hike tend to straggle. They form little groups of their own, and the conversation and laughter are not conducive to good attention and observation. Things happen quickly outdoors. A warbler may be in position for good observation for only a few seconds. Those who lag behind will not see it. The best directive for the leader of a field trip is found in "Stonewall" Jack-

son's oft-reiterated command, "Close up the ranks."

There is another cogent reason for keeping the group compact and in order. School patrons (and many school administrators) have to be convinced of the value of field instruction. A group of laughing, talking students strung out for a block or two, gives rise to the jaundiced view that the students' obvious pleasure is dictated more by freedom from the four walls of the classroom than from an inward joy in learning. On the other hand, a compact group, moving briskly and obviously going some place, creates a favorable impression.

Remember, also, that unexpected observations may also occur on the return trip. I have seen many instructors who do a competent job of leading students to an objective, and of teaching them while there, lose the good effect and the teaching opportunities of an ordered return by tacitly dismissing the group once the objective has been studied. The group breaks up, and some students rush back to school to disturb the closing minutes of a class period, while others linger along the way and arrive tardily for their next classes. Neither behavior is calculated to increase the popularity of field instruction with administrators and other teachers.

4. *The leader must create a classroom situation outdoors.* This requires new techniques, and, usually, long experience. There are, however, some guideposts.

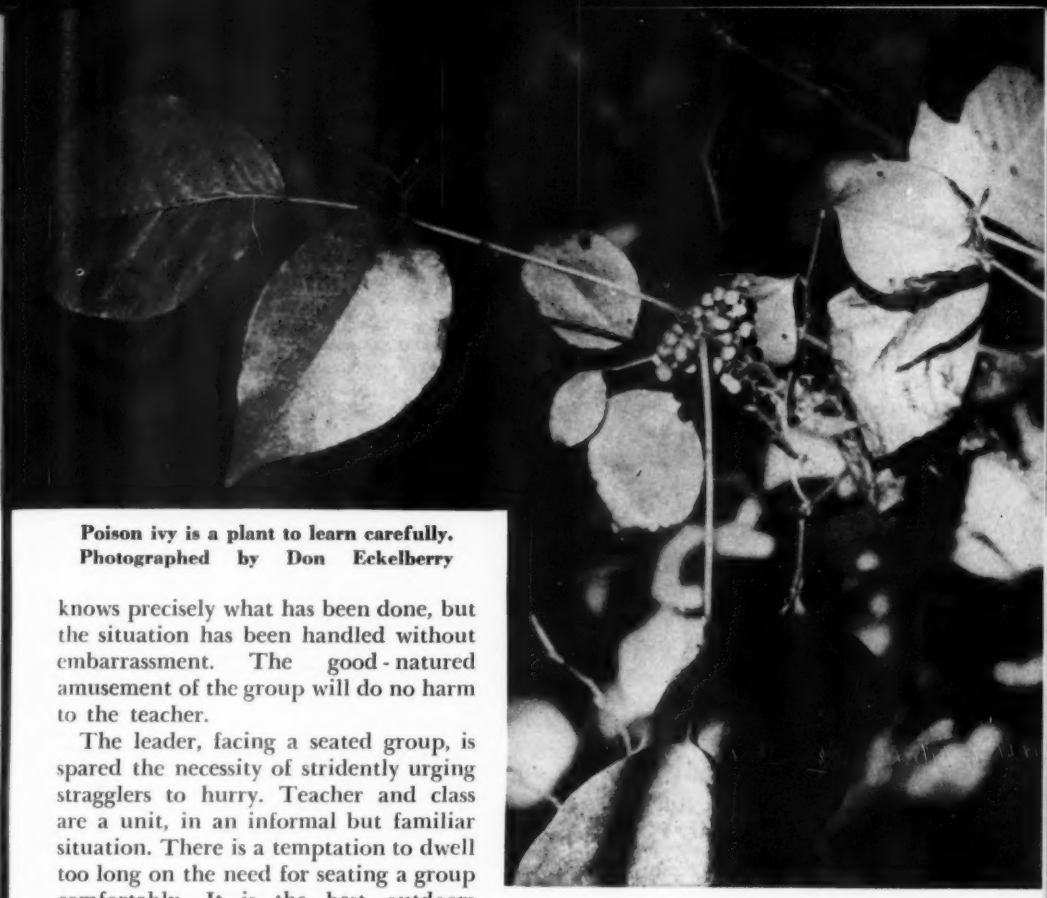
Assuming that the group has been kept closed up, and that the objective has been reached, the leader should have his group *sit down*. This is a simple direction, but it is the first step in setting up an outdoor classroom. Once the group is seated compactly, everyone in it can see and hear the leader. Notes can be written. There is no distraction of crowding and shuffling feet. If there is no place to sit down, the leader has been at fault in planning the objective of the field trip.

This is the time to answer questions which have arisen along the way. Teachers who attempt to answer individual questions while the group is in motion, will address a few students, and miss the others. A student picks up a plant and asks its name. Tell him to bring it along. When the group is seated, all may hear the question and all have the benefit of the answer. Another student has found an interesting insect. If the leader attempts to talk about it by the way, a few students will crowd up and see and hear; the rest will see nothing and will not understand if they hear.

In a group seated comfortably outdoors, student participation is easily arranged. Students may display and tell about specimens they have found by the way. They may guess at the identity of nearby trees or flowers. They can be encouraged to call attention to a bird in flight or in song, and to ask about it. They will have time to see and think about the living things which make up the community around them.

Suppose Johnny and Mary become more interested in their own affairs than those of the group. The leader says, "Johnny, I need some leaves from that tree over there. Will you get them for me, please?" When Johnny returns, the teacher says, "Thank you. Will you show us what you have?" Of course, everyone

Photograph by Gottscho-Schleisner



Poison ivy is a plant to learn carefully. Photographed by Don Eckelberry

knows precisely what has been done, but the situation has been handled without embarrassment. The good-natured amusement of the group will do no harm to the teacher.

The leader, facing a seated group, is spared the necessity of stridently urging stragglers to hurry. Teacher and class are a unit, in an informal but familiar situation. There is a temptation to dwell too long on the need for seating a group comfortably. It is the best outdoors trick that I know.

5. *Names of living things are not enough.* The leader must be prepared to clothe the names of plants and animals with details that catch attention and remain fixed in the minds of students. Yet, many an instructor thinks that he is serving his students well when he gives them names of living things, unadorned by anything to make those plants and animals personalities.

Let us draw a parallel. You go into a company of strangers with whom you have no mutual interests. You meet fifty or more of them. Unless you were cut out for a career in politics, you promptly forget every name, save, perhaps, those of the few persons who do or say something which is personal to your own experience or interests. Yet, we expect our students to meet unfamiliar things, to remember their names, and to like what they are doing!

At this point, teachers very often say, "This sounds good, but, without being specialists, where are we to get the information which will make plants and animals something more than names?" The question is fair.

Let's take a dandelion, for instance. The name is challenging, if we go beyond mere acceptance of it. What is there about the plant to suggest a lion? What does it mean anyway? The answer is in the dictionary. "Dandelion" is the French *dent de lion* anglicized. Assuming the group doesn't know French, what English word does *dent* suggest? Through "dentist," the group can almost certainly be led to "tooth," and so to "lion's tooth." "Well," someone says, "if that's its name, why not call it that

instead of something silly like dandelion." (The misunderstood is almost always silly.) The teacher goes back to the Norman invasion, and the group is soon thinking of William the Conqueror and 1066. There is a reason for the French name after all.

That, by no means, exhausts the dandelion. Is the head made up of one or many flowers? Does each flower produce a seed? Have you ever seen a dandelion with red seeds? How does it produce seed in winter when no insects are around to carry the pollen? The milky juice reminds a youngster that he has heard of rubber made from a similar plant; by the Russians, was it? The plant, or one like it, must grow in Russia then. And so the picture takes form, to remain forever in the minds of the participants.

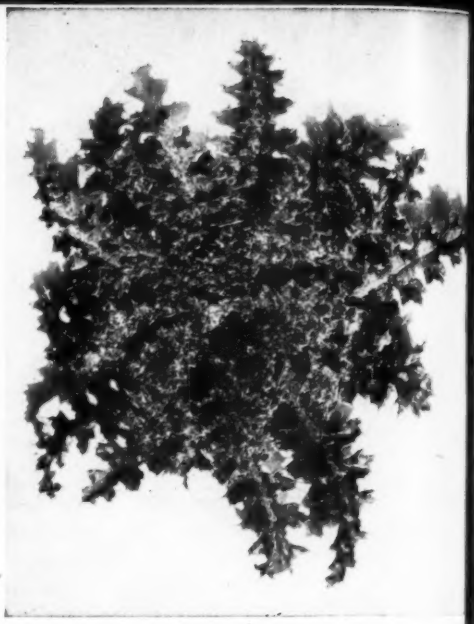
Or take a daisy — any daisy. The group may well include a girl bearing that name. Does she know what it means? Probably not, but the answer is in the hands of any high school student who has read Chaucer's "Prologue." Among the Canterbury Pilgrims,

> "A frankelein was in his campaignye,
> White was his beard as is the daieseye".

How simple it is to see the "day's eye," once you have the key!

Even scientific names are good fun when properly approached. Why not introduce them incidentally, and not as an end in themselves? This white oak tree, by the way, is called by the botanist *Quercus alba.* Where does cork come from? Might there be a connection between English "cork" and Latin *quercus*? What about *alba*? Did you ever hear of an albino, or of England's being called "Albion?"

Some scientific names are highly musical. The field class, fortunate enough to find trailing arbutus, may shudder at learning *Epigea repens,* but try introducing the name in passing. *Epi* they will have met in "epidermis," and *gea* suggests "geology," "geography," and "geometry." *Repens* may be a bit more difficult, but "repent" suggests itself immediately, and those who have had experiences in revival meetings may be able to figure out the literal meaning of the word. So the poetical *Epigea repens* becomes the informative phrase, "creeping upon the earth." And why, by the way, in New England is arbutus called "Mayflower?"



The lion's tooth, photograph from American Museum of Natural History

The horrendous *Liriodendron tulipifera* becomes simple and amusing when translated into "the tulip tree bearing tulips." Saxifrage, "rock-breaker," and *Ranunculus,* "little frogs," are highly suggestive. So are *Vermivora,* "worm-eaters," and *Spizella,* "little sparrow." The student who meets scientific names in this off-hand manner overcomes his fear and disdain.

Many excellent books deal with plant and animal names and their meanings, and the unabridged dictionary is a never failing source of help. My education professors used to tell me (this may date me with the dodo) that there is no "carry-over" between branches of learning, but I believe that the student who explores the meaning of names of living

things may find a little more sense in history, English, and even Latin.

6. *The leader must discover the level of his group, and teach at that level.* This would be simple except for the fact that (1) few groups are composed of individuals at the same level; and (2) the leader may be interested in rarities.

I have followed leaders who were experts in the field; in every respect competent to give stimulating instruction. Yet, very often such a leader lets himself be surrounded with two or three others of similar experience and training, and the conversation and teaching become filled with technicalities which are highly interesting to the minority, but completely beyond the majority.

From experience, I know the pitfalls inherent in the rarity which turns up on a field trip. The group may consist predominantly of beginners, who should be learning house wrens, chipping sparrows, and barn swallows. Suddenly the leader detects a challenging song. He takes the whole group off on a chase of the songster until it has been identified to the leader's satisfaction at least, as a Cape May warbler. In the discussion which follows, the group is properly impressed by its good fortune in seeing so elusive a bird, excessively rare in that locality during spring migration. Everyone is interested — but perhaps a quarter of the field-trip time has been given to a bird which is likely to remain outside the common experience. Chipping sparrows and house wrens, birds which the group might meet every summer day, must wait until a more convenient time.

There are many summer camps which cater to teachers, most of whom are amateurs in outdoor study. These teachers need to recognize common plants and animals of general distribution, species which they may find about their homes in Connecticut, North Carolina, or Illinois. Yet, the natural tendency of leaders in such camps is to pay particular attention to local rarities. Of course, species of special interest should be pointed out, but not in disproportion to those more commonly and widely distributed. The leader's obligation is to give the maximum amount of information which will apply in the home communities of his group members.

If the group which you are leading contains experts in certain outdoor lines, invite them to assist you in teaching the beginners. Everyone profits from this, and it discourages distracting private discussions among the more experienced members.

7. *The field trip should train people to use all their senses.* In good classroom teaching, much is made of multiple-sensory appeal, yet this sound principle is often neglected in field teaching. There are many ways to learn about living things, and the experienced field leader will use all of them.

One of the best essays which John Burroughs wrote was titled "Browsing and Nibbling." Taste and odor are characteristic qualities of many plants. Within the limits of good sense, they can be used to excellent advantage by the field leader.

Suppose we return to the fence-row community discussed earlier. The group members will accept the word of the leader that a certain bush is sassafras, but if they taste some of the bark, they

The day's eye. Photograph by Helen G. Cruickshank

will *know* it for themselves. Some persons may question the leader's identification of wild cherry, but once they taste its bitterness, they remember it and have a good tool for future identification. If the sumach has red or orange berries, they may safely be tasted, and their pleasant acerbity fixed in mind.

When persons are asked to taste an unfamiliar substance, someone is certain to ask, "Is it poison?" The leader must be sure that he is not playing with fire. I have seen teachers who thought it smart to urge students to chew the root of Indian turnip. This is downright cruelty, and the student will rebel at tasting any other unknown material.

A common question in the field has to do with the separation of poisonous and non-poisonous mushrooms. One leader advised his group, quite correctly, that there was no sure separation characteristic, but that one way to make reasonably sure was to place a sliver of mushroom on the tongue, and to await a burning or nauseating sensation. This may be safe for the expert, but it is not advice to give high school students who might sample enough of one of the *Amanitas* to produce serious results.

Many persons have an inordinate fear of touching certain living things, especially snakes, salamanders, and some insects. This fear may be so all-embracing that the individual can take no pleasure in the outdoors. The wise leader doesn't rush things, and can often overcome such dreads. The student who, through encouragement, not coercion, can be brought to touch a snake, discovers that it is not slimy or otherwise unpleasant to the touch, and becomes more comfortable on future trips afield.

Sound policy dictates that the leader first taste or touch objects before he asks this of others. Participation by the students then becomes a matter of fair play and good sportsmanship.

8. *Every field trip should teach some principles of conservation.* Biology and nature study courses, which fail in leading students to a greater understanding of, and broader appreciation for, our natural resources, are poorly planned and incomplete. If our country is to be as we wish it, our people must absorb the principles of conservation as they do their Americanism.

The leader may easily point out that many plants cannot stand continuous close picking; that an aimless blow of an axe against a tree may open the trunk to fungus disease and ruin a valuable log; that cattle, grazing in a woodlot, destroy nests and nesting places of birds; and that a carelessly dropped match or cigarette may destroy the forest growth of a century. Such teaching can be done incidentally, but effectively.

City people, as the Friends of the Land have been telling us so well, have a greater stake in soil and water conservation than do those who live on the farm. The rural dweller may be able to scratch out a living from marginal or sub-marginal soil, but the urbanite must depend for the food he eats on soils which produce a surplus. If the city does not care about Iowa corn lands, Dakota wheat fields, and the western cattle range, there may, someday, be nothing for it to care about.

Conservation is dynamic. Properly presented, it kindles enthusiasm and unites its followers in a common cause. In the field, it supplements formal instruction by adding an action program. Not only does the student learn of the outdoors; he is also given the constructive impulse to protect and preserve it. Thus, does faith become works.

This is the final test of a good field trip. If the leader is able to bring to life and individuality the plants and animals about which he teaches, it must follow that his students will look upon them as important links in the chain that is the community. Once our people have seen this light, they will be the more ready to join in keeping America's soils fertile, her streams sparkling, her forests green, and her wildlife abundant.

William H. Carrick

It Happens in Our Neighborhood

The youngsters find magic and mystery in the wide world of nature right at the doorstep

By Mary B. Kilcawley

"QUICK! Hurry! I saw it walk out." There was a newborn cicada on the telephone pole across the street and Tom saw it step out of its shell. The body was a delicate lavender-pink and the wings shimmered in the bright August sunshine. Three years before, when Tom was only three, he was present in our backyard laboratory when we were studying this insect. "Its back looks like a church window," he had said. Now the the children are familiar with cicada's life history. "Sing, cicada, sing!" they cry. They do not want to injure one because it has such a short time to live.

One morning we watched a caterpillar crawl down a primrose stalk. "Does a caterpillar know he's going to have wings and fly in the sky someday?" Tom wanted to know. He has never recovered from his surprise of several years ago when he first discovered that a yellow butterfly emerged from a chrysalis which he had watched a green worm make.

Under the scrutiny of wide awake children, my small backyard has become a rich laboratory. They find caterpillars of the morning foresters, hawk and sphinx moths, cabbage and puddle butterflies. They watch hummingbirds darting from

flower to flower of the ragged robin. They keep an eye on the dramas enacted in the old bitternut tree where downy woodpeckers, flickers, starlings, blue jays, chickadees and wrens quarrel over the holes in one of its dead branches; and where chipmunks and nuthatches seem to be playing hide and seek, for the head of first one and then the other will appear in an opening.

Like town criers, the children go up and down the street, calling all the young scientists to the laboratory whenever something unusual is happening. If it is Good Friday, a polyphemus moth is emerging from a brown cocoon that the children watched a green worm weave on a hot day the previous August. If it is a Sunday in June, the Io moth, with the injured wing, is laying her eggs in a glass jar. A hunt may be on for the giant slug that has slipped out of the box of dirt. Or, perhaps, a gray squirrel is husking an ear of corn.

One afternoon, a little black moth with white polka dots on its wings and coral rings on its legs walked out of one of the many channels that had been burrowed in an old dead branch which we kept in our "porch museum." The children gathered to see the miracle—a dainty moth that came out of the inside of a tree!

Some of them looked at the moth in awe. Others were skeptical until they heard this story:

On an evening during the summer, the children had held a twig in their hands for three hours while they watched a caterpillar chew its way into the wood. The next morning when they looked at the twig, the hole which they had seen the caterpillar make, had gone. Examining it more carefully, however, they discovered that the hole had been neatly sealed during the night. They saved the twig until spring. Then one day, they found that the seal had been chipped. After waiting for several days, the children removed the cover. There, in its self-made casket, lay a little black and white moth—the morning forester. It was alive!

The older children in the group are always considerate of the little ones. Nicky, next door, was only a year old when he came to the "lab" to beg for a bug—one of his first words. He soon learned how to pick up caterpillars and would dance up and down when the woolly bears crawled up his arms and around his neck. He often went on short bird walks. Whenever he pointed out a bird, the others would applaud; he would laugh, clap his hands and tumble in the grass overcome with glee!

Our age group changes, as children move in and out of the neighborhood. If the group is old enough to venture beyond the backyard, we visit a nearby ravine, a sand bank along the creek, an open field and a hillside.

"The whole world is a laboratory," one child remarked. A practical one answered, "Yes, but we can take only a little bit of it at one time." So we sample "a little bit at a time," and our favorite "out in the world" laboratory has been named "Smoking Log." It's up on the brow of the hill that overlooks a beautiful valley. A few years ago a storm tore away one of the huge branches of a great white oak that stands sentinel on this hillside. From this old branch we chip charcoal to kindle fires for hot dog roasts.

Even when the boys and girls are at play here, they seem to be aware of things about them for they search the ground and trees for specimens. They don't keep written records, but many things have registered in their minds for it is not unusual to hear them say: "We saw them . . . we heard that . . . we found it . . . 'member? Up at the Smokin' Log."

The children have observed that the birds also like this spot and are willing to share it. Crows, flickers, orioles, blue jays, flycatchers, redwings and cowbirds perch and call from the high branches of the old oak. The downies tap their

way up the tree; the nuthatches wind their way down, head first. The redstart sings to his mate in the hemlock. The children listen for the song of the wood thrush to come up from the ravine. The whistle of the veery never fails to startle them. They can always hear a field, song, vesper, savannah or a chipping sparrow singing as it sits in the shrubbery nearby or swings from the weed tops on the old meadow. They watch the goldfinches ripple across the valley, and the hawks spiral out of sight in the distant sky.

The farm road that skirts the meadow and passes through the briar-tangled locust grove leads to the plowed field and the sand bar by the creek. When the road turns right, it passes along the bank of the creek to the farm gardens on the flats. This is a large laboratory; but children soon learn where to look for interesting things. The rose-breasted grosbeak, the chewink, tanager, chestnut-sided warbler, indigo and yellow birds are only a few of the many that nest in this area. The pheasant and her brood are near the huge brush pile. A killdeer may be sitting on her eggs that lie on the shale in the open field. The kingfishers rattle up and down the creek. A young

Helen G. Cruickshank

Helen G. Cruickshank

boy may see a black-crowned night heron, a blue heron, or an osprey as he wanders along the edge of the water.

Many of the children know when and where to look for the first skunk cabbage, and later, the trillium, bloodroot, trout lily, Dutchman's breeches and saxifrage. All these spring flowers and many more grow in these laboratories. Black-eyed Susans, fleabanes, bugloss, Queen Anne's lace, chicory and sweet clover are among the flowers that in mid-summer transform the uncultivated fields along the creek into a riot of color.

The flat rock with its pot-holed steps —a promontory at the bend in the creek —serves as a lookout for another field laboratory. One afternoon, Flick was gathering pieces of colored shale at its edge when a sandpiper whistled. She turned and said to me, "That sandpiper whistles to me every time he goes by." Then, as she knelt there, she looked up and said, "You are a good woman. I love this place. Don't you?" There were eight other children scattered along the bank of the creek that afternoon. Each doing something that he or she loved to do; but always on the lookout for something to share with the others.

One day, the children brought three half grown caterpillars of the monarch butterfly to the porch museum. An ichneumon fly hatched from the body of one. The second made a beautiful pale green chrysalis. Someone dropped and dented the chrysalis and when the butterfly hatched, they discovered that it

had an injured wing and could not fly. The third caterpillar showed them how the chrysalis was made. After pressing its two suction caps, or end props, against the cover of the jar, the caterpillar started throwing its body from side to side. When the body shortened a little, it swung its head up and tapped sticky thread from its mouth to the props. When this hardened it became a small gray stem.

On a later day a child reported that there were white spots on the black substance inside the chrysalis. As the green faded away and the gold lost its glitter, the brown in the wings appeared. The children came often during the day to watch it. Eight of them rushed breathlessly to my back porch, just two minutes too late to see the butterfly emerge. They found it clinging to the fragile chrysalis, and for more than an hour we watched this beautiful creature slowly fill the veins of its wings and then wait for them to stiffen in preparation for flight. The children felt they had a part in the creation of this gorgeous jewel. "Wasn't it *really* made from the leaves of the milkweed that grew beside Jamie's porch?" The pride with which they looked at their masterpiece was, indeed, inspiring. Oh, how buoyant were their spirits, that afternoon, when they ran down the driveway!

The children do not always wait for things to happen; now and then, the older ones "hatch up" plans of their own. One hot July day they decided to draw a map of the old cemetery and "put every tree and shrub on it." They divided into sections and set to work. Enthusiasm was at high pitch while the tree inventory was being taken, but it petered out as the space on the paper grew smaller and smaller. The plan did not fail; the paper just wasn't big enough.

Another plan was inspired by the appearance of tussock-moth caterpillars swinging on tiny threads from the poplar trees. Jack decided to prove the proposition: Little creatures can kill big trees. He spent part of the day gathering the leaves of poplar, oak and birch that had been wholly and partially destroyed. Late in the afternoon, he presented his evidence.

The leaves, nicely arranged in some old gilded picture frames, contained holes of different sizes and shapes. Some had been slit down from the tip end by single caterpillars; others were cut straight across by armies of tiny caterpillars, head to head, eating their way down the leaf. Some looked as if they were made of lace, as if the delicate network of veins had been woven with thread; baby caterpillars had eaten off every speck of green. The older caterpillars left only the midribs and a few of the larger veins. These looked like skeletons as they hung from the leaf stems. Equally interesting, was his collection of oak leaves that were covered with galls. They revealed that insects had also used the leaves as safe hiding places for their eggs.

While Jack was busy with his special project, Jimmie took an inventory in the garden of all the plant leaves through which leaf miners had passed. Assisted by his two small sisters, he chose only those leaves that were interesting from the standpoint of color, shape and special miner's pattern. The nasturtiums, wild columbines and spider plants furnished the greatest number of specimens. Arranged in picture frames, the display not only presented scientific information but produced an artistic effect as well, since small flowers and choice petals were added for decoration.

Although I have devoted a great deal of time to the children, they have given me much in return. I can't *prove* that their experiences will help them to become well adjusted youths instead of bewildered teenagers, but young minds are impressionable, and the experiences and thoughts they have as children are capable of molding their lives and enriching their later years.

A DESERT, according to the dictionary, is a place "forsaken . . . desolate . . . without life"; a definition with which the average run of eastern visitors to the southwest agree all too heartily. Every native Californian, upon one occasion or another, listens patiently while a newly arrived traveler disparages the arid lands through which he has recently passed. Describing the desert as "ugly," "barren," and "lifeless," the casual visitor says: "Once you've seen a mile of desert, you've seen it all."

The native is faced with three alternatives: to say nothing; to blast the offending novice with a barrage of arguments in favor of desert wonders; or to transport the newcomer back to the desert and allow this "ugly, barren and lifeless" region to speak for itself.

When given ample opportunity, any desert area can defend itself well against the verbal onslaught of unseeing strangers, but there is one region whose rebuttals are delivered with particular eloquence. It offers its defense in terms of silent majesty and infinite space, of spectacular geologic phenomena and subdued yet incomparably beautiful coloring, of fantastic vegetation and diverse fauna. Yet on a road-map, it is indicated modestly by a dot of blue and the following caption: SALTON SEA.

Situated in the center of a golden, sun-baked plain, the Salton Sea at first glimpse might appear to be just another mirage to tantalize the desert-weary traveler. Because of the salinity of its waters, its shore line plant life differs little from that which grows on the waterless areas

SPEAKING OF DESERTS

By Ken Stott, Jr.

Photographs by G. E. Kirkpatrick

In the Salton Sea area, more than 200 feet below sea level, the California desert reveals majestic facets to the naturalist

American egrets, white-faced glossy ibis, and California gulls feeding together on insects in a cultivated field near the Salton Sea.

extending for miles on every side. Only at the southern tip where fresh irrigation canals empty into the sea is there any vegetational hint that a large body of water lies nearby. There, willows and other marsh plants grow in profusion but elsewhere the borders of the sea support only a typical growth of desert plants, thorny and sparsely leaved.

The Salton Sea, whose surface lies more than two hundred feet below sea level, occupies what was formerly the bed of an inland sea. This ancient predecessor is now known only to geologists, who designate it as Lake Cahuilla or Blake's Sea. Its only obvious vestige consists of a travertine shore line whose periphery is far greater than that of the present sea. At some time in past ages, the waters of Lake Cahuilla broke their way through the highlands which separate it from the Colorado Delta and poured southward into the Gulf of Lower California. For centuries the area was waterless with the exception of a few alkaline springs. It was in 1905 and 1906 that the floodwaters of the mighty Colorado River overflowed their banks and came tumbling down to collect in the bed of the prehistoric sea. Since that time its level has been maintained largely by the drainage of irrigation waters from the fertile farmlands to the south as well as the winter season torrents which flow from the jagged, purple mountains on the east, north and west.

The present sea, which has an average length of thirty miles and a width of eight miles at its broadest point, fluctuates considerably in size due to variances

of rainfall in the surrounding mountains. Local precipitation contributes little to the waters of the sea, for the average annual rainfall ranges from one and a half to three inches. What rain does fall either evaporates or is absorbed by the thirsty soil and the taproots of parched desert plants. In the Salton Sea temperatures reach almost unbelievable extremes and may vary as much as 59° F. within a twenty-four hour period. Within an average year they may range from 26° to 125°.

Vegetation, more than any other feature of the desert, indicates clearly the dearth of water and the prevalence of extreme temperatures. Weird and grotesque plants have resulted from the manner in which each has sought to compensate for such conditions. Some, like

Left: The mud-pots at the southern end of Salton sea resemble miniature volcanoes.

Right: Washingtonia Fan Palms in a desert canyon.

the straggly creosote bush, have developed extensive root systems; while others, like the cacti, are supplied with built-in, above ground reservoirs.

To the botanist, the Salton Sea offers a wealth of material. Here the plants which typify the Colorado desert are supplemented by an unusual array of unique forms. A few miles from the west bank of the sea a scattered group of elephant trees may claim the distinction of being the only stand of their species in California. Elsewhere within the United States, they are found only in Arizona. Low-growing and gnarled, they gain their name from the characteristic bulbousness of their trunks and limbs and the alleged similarity between their scaly bark and the skin of an elephant. When cut or injured, they secrete a crimson, viscid sap which has caused them to become known to local Indians as "the trees which bleed."

Of the plants indigenous to the area, that which most intrigues visitors is the Washingtonia Fan Palm. Although it is to be found in a few scattered groves in southern Arizona and northern Mexico, it may best be seen in the steep-walled ravines which open from the mountains onto the Salton Sea basin. Unlike most palms, these do not demand high humidity, their only requirement being the presence of the subsurface water which seeps through the soil of desert canyons. In a few canyons where running water is supplied by springs higher in the mountains, the palm stands are dense and lend their surroundings a tropical touch. Gray-bearded and thick trunked, they reach an impressive height of one hundred feet. These isolated oases provide heaven-sent refuge on blistering summer days for desert travelers as well

as for the mule deer and bighorn sheep which roam the barren, rocky hillsides.

Of all naturalists, the ornithologist is perhaps best favored by the Salton Sea region. Here he may feel akin to a naturalist on the Nile delta, for each region boasts of a unique resident avifauna as well as prodigious transient population. Large numbers of herons and egrets are to be found about the sea throughout the year as well as white-faced glossy ibis and white pelicans. Red-wings and yellow-headed blackbirds swarm over the marshes, and vermilion flycatchers flutter like animated coals from bush to bush. Characteristic of the arid areas about the sea are the diurnal burrowing owl and the roadrunner, a pheasantlike member of the cuckoo clan. Throughout the day a rolling chorus of cactus wrens is augmented by the staccato bugling of red-shafted flickers and Gila woodpeckers.

The greatest ornithological thrills come in midwinter when thousands of migratory wild fowl arrive from the far north to seek refuge on and about the sea. Clouds of geese, ducks and shore birds descend upon the marshes and fill the air with their calls.

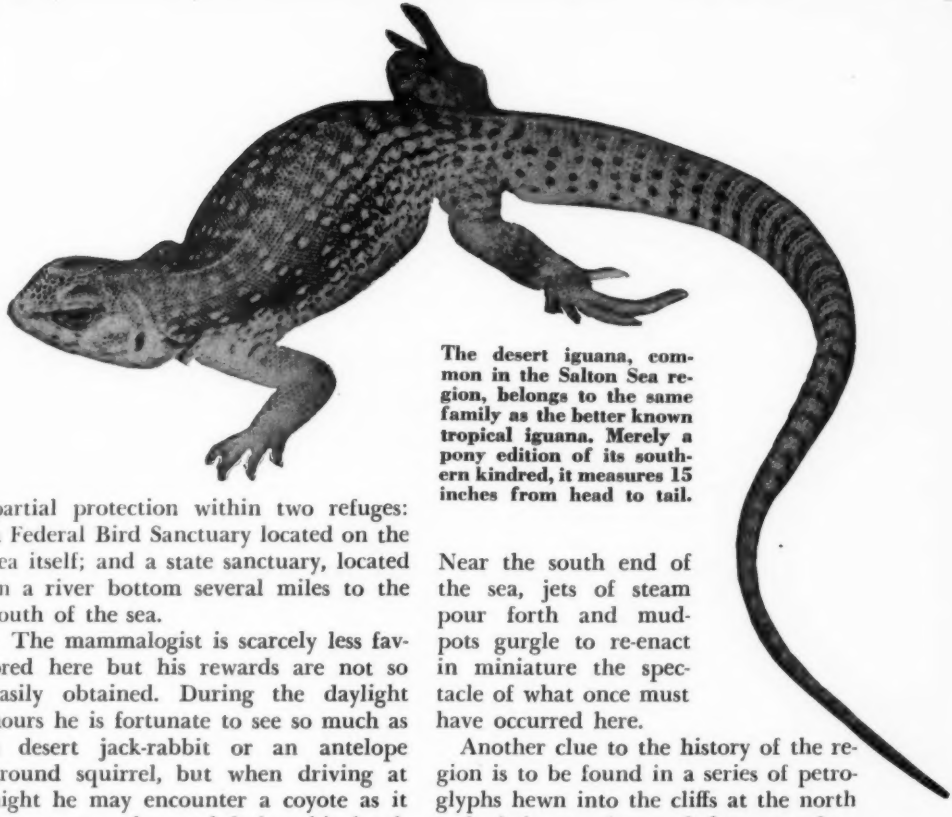
Throughout the night only the whisperings of unidentifiable wings reveal the presence of this vast wild population. Then, as the first thin glow pushes its way over the eastern horizon, the ducks, after a night of feeding in nearby rice paddies, come whirring down to the marshes in one seemingly endless flock. Baldpates, mallards, lesser scaup, canvasbacks, and shovellers, in one cohort after another, splash upon the sea. The greatest of all shift-changes has begun.

As the ducks pour in, the geese flocks, which spend the hours of night floating on the smooth waters of the sea, begin to leave for the fields. Over they go, one flock after another: lesser snow geese, their satiny breasts pink in the early morning sunlight; honker flocks with a handful of white-fronts tagging along in the rear; and now and then a group of fat little cackling geese.

From the chorus of bird conversations in the marshes a new sound emerges. It is the most awesome of all bird noises, the rolling, sonorous call of the crane. *Ka-rrrrrrr! Ka-rrrrrrr!* The cry comes louder and clearer and soon a long, wavering line of birds drifts into sight. They pass low over the ground, so low that the soft swish of their long-fingered wings is clearly audible. Most of them are little browns, but here and there in the formation flies a larger bird, probably a sandhill. The crane flocks are on their way to the fields to feed amidst the geese and gulls.

Summer presents an entirely different picture. Gone are the flocks of ducks and geese, but in their places there are other, equally interesting birds. The resident birds are joined by hordes of wood ibis which have spent the winter and spring months in warmer climes. Fulvous tree ducks dabble in the mud along slow-flowing irrigation canals, and gull-billed terns soar over-head as they search for grasshoppers in the alfalfa fields. On rare occasions a roseate spoonbill or two, wandering farther north than the bulk of their companions, drop in to add a splash of color to the landscape.

Migrating bird flocks which pass through the Salton Sea region are of course depleted considerably by hunters as well as by farmers who resent the damage inflicted on their fields by feeding ducks and geese. The birds receive



The desert iguana, common in the Salton Sea region, belongs to the same family as the better known tropical iguana. Merely a pony edition of its southern kindred, it measures 15 inches from head to tail.

partial protection within two refuges: a Federal Bird Sanctuary located on the sea itself; and a state sanctuary, located in a river bottom several miles to the south of the sea.

The mammalogist is scarcely less favored here but his rewards are not so easily obtained. During the daylight hours he is fortunate to see so much as a desert jack-rabbit or an antelope ground squirrel, but when driving at night he may encounter a coyote as it lopes across the road before his headlights. By the same means he may catch fleeting glimpses of swifts or desert foxes, or bouncing families of kangaroo rats. Bobcats are fairly numerous in the area and, if the tracks in the mud on the banks of the sea are an indication, raccoons must also be common there.

Any desert land is a herpetological paradise and the plains and mountains about the Salton Sea prove no exception. Side-winders and other rattlers as well as countless non-poisonous species of snakes emerge on the mild evenings of late spring and early fall to prey upon rodents. During the day strange and handsomely marked lizards engrave intricate designs on the sand as they scamper from one shaded spot to another.

For the geologist, the area offers telltale marks of a volcanic history—boulders of pumice atop layers of silt, and deposits of obsidian whose surfaces are broken by a thousand glittering facets. Near the south end of the sea, jets of steam pour forth and mudpots gurgle to re-enact in miniature the spectacle of what once must have occurred here.

Another clue to the history of the region is to be found in a series of petroglyphs hewn into the cliffs at the north end of the sea. Some of them are clear and well-defined, while others have been partially obscured by a screen of travertine, deposited during the high watermark days of Lake Cahuilla. The artists are unknown and whether they inscribed these symbols before the ancient lake existed or merely before the last period in which it rose is yet uncertain.

Today other artists of another generation and another race are here to carry on the tradition. Their tools are not knives and chisels, but brushes and pens. They, with the naturalists, the archeologists and the geologists, seek the soul and the secret of the land. While the scientist looks for his answer in material evidence, the writer and painter must be content with less tangible stuff. They must strive to record the searing quality of sandy wastes, to measure the amounts of purple and gray in summer haze and to recreate the terrifying beauty of a desert land.

Do you know

of any nesting localities for the lark sparrow or the black skimmer?

PRELIMINARY maps showing the present known breeding distribution of the lark sparrow and the black skimmer in the United States and Canada appear in the May issue of the new *Audubon Field Notes*. Everyone can make a definite contribution by sending nesting records for these species to *Audubon Field Notes* for the corrected maps that will be published in an early issue.

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AUDUBON FIELD NOTES

Published by

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Behind the scenes at Audubon House

WHEN you call Butterfield 8-2640, a cheerful voice with a welcome ring in it answers "National Audubon Society." It belongs to Ida Pederson. Through that board of hers, she keeps her finger on the pulse of Audubon House; and she's always there to hook up the electrical currents that enable the rest of us to carry on our jobs. Her daughter, Joan, age 12, has developed a great nature interest through her contact with our Society. Her son, Richard, age 15, is a true follower of Izaak Walton.

AND there's Irving Benjamin, affectionately known as "Bennie" (especially when we want to borrow a dollar bill just before payday). He is Assistant Treasurer and on April 17 of this year, celebrated his 30th anniversary with the Society. During those three decades, he has earned a B.C.S. (Bachelor of Commercial Science) and a degree in law by going to school at night! But Bennie isn't one to rest on his oars—he's learning to rhumba now—and his seventeen year old daughter is his teacher! On week-ends, he takes 15-mile hikes with his Boy Scout son.

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The Land and Wild Life

By **EDWARD H. GRAHAM,** ***Chief of the Biology Division, U. S. Dep't. of Agriculture***

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Mr. Benjamin and his assistant, Emma Grace, look very businesslike as they ponder over that strip of adding-machine paper, wondering if a sour figure could have slipped in by mistake. But Emma is probably explaining in quatrains, for she is a poetry enthusiast and can discuss bookkeepinng matters in any meter. Next thing you know, our "financial report" will appear in verse that really *jingles*!

WHEN you become a member, Douglas Orbison takes you under his wing. As membership secretary for the past ten years, he has come to know practically every one of you by your first name! The fact that 89.6 per cent of our members renew each year, proves that Mr. Orbison keeps us all reminded of the importance of supporting the Society's work. Our "Orbie" is the wit of Audubon House and we can always rely upon him for some bright sally to relieve the tension of a momentary office crisis. His pet name for *Audubon Magazine* is "Maggie" and does he rag the old girl when she gets in a jam! At the moment when the pictures were snapped, he and one of his assistants, Mrs. Effie Melchior, were chasing down the address of a new member in the Atlas, while June Pulver, Mrs. Mireille Osborne and Georgina Brock (left to right) were checking on some of the other 450 new members which joined the fold between mid-May and mid-June.

AN essential ally of every department is our hard-working stencil room. The steady *thump-thump-thump* of that stencil machine is like music to our ears for it assures us that the names of members and subscribers are being impressed on magazine wrappers, and on envelopes for many other mailings.

Although "Morgie" (otherwise known as Ruth Morgan or Mrs. Fred Eggers) has worked in many different departments during her 12 years at Audubon House, she now concentrates on the all-important job of keeping stencils up-to-date and of bending that ominous-looking machine to her will. Sigrid Lee (Allan Cruickshank *insists* on calling her Gypsy Rose Lee) assists Miss Morgan, and has been part of our Audubon family for more than 10 years. They are giving a recalcitrant stencil the eagle-eye.

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THE best things come in little packages, the saying goes. Catharine Wood, the dynamo of our Photo and Film Department, is a tiny little girl with a big job. Our library of wildlife movies and glossy prints is the best in the country, and Kay spares no effort to keep it that way. Schools, magazines, newspapers and book publishers come to our files for illustrative material on wildlife, and Kay (right) and Nancy West (left) give them SERVICE with a smile. Nancy is known as "The Splicer" and there she is getting ready to splice some glorious new sequences into a film.

IN the next issue, and the next, we'll try to carry on with this series of *Audubon House at Work*. It's only fair to include the picture of the photographer in this sequence, however, since he is really a specimen worth looking at. Behold: a chap who likes to take pictures of people! A rare species of photographer around *this* house.

For years, we have been talking about running a series such as this in *Audubon Magazine*. The world's best photographers pass through these portals — yet not a one of them want to take pictures unless they can set themselves up in an uncomfortable blind where they are persecuted by mosquitoes or black flies or sand flies or goodness knows what!

And then Stewart Merk turned up in our mailing department, on a temporary job. We didn't know that he was a photographer, until he started taking flashlight pictures of his companions in the basement, after hours. So we corralled him for the Junior Club series (published in last issue). On Friday, June 13, he resigned, to go back into business with a former partner in the photographic field. He made these pictures on Monday, June 15 — his first independent assignment on his new job!

DO these Audubon House picture-spreads give you an editorial idea? They have given me one. Think of what a nice job we could do on our various clubs! A two-page spread—something like the Junior Club spread last issue—could tell the story of your club, in brief. Plan a series of pictures based on the activities of your club—pictures of some of the members on a field trip, wading in the marsh, climbing a tree—even falling in the brook as Mrs. Comby of Los Angeles said she did not long ago! If you plant trees with school children, let's have a tree-planting picture. If you build gates or benches or bird baths or bird houses for the club sanctuary—snap one of your members at work! If you are going to include a picture of your president, show him pounding the gavel to bring a meeting to order, or banding birds, feeding his pet duck, climbing up to a hawk's nest—or whatever characteristic pose would be appropriate.

Once you put your mind to it, you'll think of

so many good picture-subjects that you'll wonder how to narrow down the choice. That's fine — send us more than we can use, so that we can pick and choose for layout purposes. Just be sure that a selection of five or six pictures will tell a little story about your club; and send captions and a couple of pages of typewritten copy. We'll have to cut the copy down, but then that's our stock in trade. We wish the St. Louis Bird Club would make a picture-story of one of its famous May celebrations. We told Mr. Buchheister to suggest it when he was the guest of honor this past spring – but perhaps he was too modest. How we longed for a picture of Carl Buchheister riding the elephant at the zoo — for that is the particular "honor" reserved for visiting dignitaries, we are told!

ABOUT THIS ISSUE: In spite of all the wonderful photographs in our file, we are constantly running into blank spots when we start a search

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for illustrative material for one article or another. Where would we find pictures for Sally Carrighar's Jackson Hole "Leopard Frog?" We wrote letters to a number of people—and Lynwood Chace came forth with those nice underwater scenes. But they are from a tank in Connecticut! Don Eckleberry's spatterdock in the pond was taken far from Jackson Hole, also. What do you do in a case like that? You simply edit "Jackson Hole" out of the author's copy! However, we have to tell you this little behind the scenes incident because the locale of "Leopard Frog" will be revealed when this chapter appears in Miss Carrighar's new book, "One Day at Teton Marsh," to be published on September 25 by Knopf.

You'll want to add this beautiful new book to your library—it is illustrated by George and Patricia Mattson, husband-and-wife collaborators, who are known to many westerners, particularly for their work done for the California Academy of Sciences.

Not so long ago, the concrete-dwellers in New York City began to take a new lease on life. These poor benighted metropolitans seldom get closer to nature than the sight of a bedraggled geranium plant in a window-box, so it was only natural that when "nature editorials" became a regular feature in the *New York Times*, they became the talk of the town. Haydn Pearson writes many of those editorials—and now he has written a couple of similar essays for us. One appears in this issue (page 228), and we are happy to be able to introduce him to those of our readers who are not already familiar with his work.

One of his books, "Country Flavor," is a compilation of the *Times* editorials. A forthcoming book, "Sea Flavor," contains many essays about the birds along the northeastern coast. He is also the author of "The Countryman's Cookbook," "Success on the Small Farm." and "Successful Part-Time Farming."

All of you who subscribe to *Audubon Field Notes*, know that John Aldrich (page 221) is now helping with the editing of that magazine. He is head of the Division of Distribution and Migration of Birds in the Fish and Wildlife Service.

The author of the article on Connie Hagar (page 195) is now taking her life in her hands. When the editor writes an article, who edits the editor? She didn't want to get caught on that one, so she pressed Ludlow Griscom, Guy Emerson, Roger Peterson, Dick Grossenheider, Dr. Oberholser and George Williams into service. George Williams is an English professor, remember, and the author of a number of successful text books. He pulled me out of a number of pits into which I had fallen. How could we get along without helpful friends?

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